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The Arab Peasants of Palestine

by CONSTANTIA RUMBOLD

Miss Rumbold's father, Sir Horace Rumbold, was a member of the Royal Commission which recently visited Palestine, and she accompanied him thither. Her article provides a pendant to the article on Jewish agricultural settlement in Palestine which we published in July 1936, and affords our readers an opportunity of seeing both sides of this vital problem, in its geographical and human aspects

THE occupation of Palestine by the Arabs is, from an historical standpoint, but a recent affair compared with the immense stretch of history which precedes their invasion of the country in the 7th century A.D. It is a matter of some 1300 years. And yet one is apt to forget that both Jews and Arabs spring from the same Semitic stock and that for 2500 years before the actual Arab invasion, Semitic peoples of different denominations had continuously drifted into Syria from the eastern deserts.

The Palestine Arabs today, living in the hill villages and tiny hamlets of the plains, are now recognized as undoubted descendants of the Canaanites, the Jebuzites, the Hittites, the Aramaeans and all those early tribes. It is possible that in parts they have Philistine and Phoenician blood in their veins. Certain it is that the only true Arabs in Palestine, of pure Arab blood, are the nomad and semi-nomad *bedawin* who dwell to this day in their black camel-hair tents, the 'tents of Kedron', and who form a large, if wandering, section of the population.

After the brief flash of Abraham's appearance in Syria somewhere about 2000 B.C. when, with his flocks and family, he trailed like a comet from Ur in Mesopotamia to Hebron, there is an interval of darkness in the history of the country until the later civilizations swept over it. Starting with the Egyptians and ending with the Turks, invasion followed invasion in successive waves. But each receded in turn, leaving comparatively little mark on the rural population. The country remained one of small tribes broken up into indefinite territories receiving the back-

wash from the desert, being peopled by clans from beyond the Euphrates, from across the Tigris, from out of the Nile Valley and Southern Arabia. Thus was Syria populated. Her history is a long record of the same process at work. But underneath the powerful influences of successive foreign empires, which civilized her for a time and then lost her, Syria remained a tribal country, composed of independent little clans separated from each other by a wilderness or a ravine and fitted into the shelves and corners of the hills.

It is this tribal characteristic of the country which has, to this day, prevented the Palestine 'Arabs' from presenting a united front politically. Arab leaders are not right-wing or left-wing as such. Political parties are family affairs, affairs of clans still. You belong to the Husseinis or the Nashashibis, and the members of one clan watch and mistrust the members of another wholeheartedly.

Few lands can have received the influx of so many diverse races through the ages: Egyptians and Israelites; Assyrians and Babylonians, who in turn destroyed the Jewish kingdoms of Israel and Judah and carried off the cream of their people into exile; Persians, Greeks and Romans, the last-named completing the dispersal of the Jews from Palestine and making an end of Jerusalem as a Jewish city; Arabs, Crusaders from half the nations of Europe, and finally the Turks.

Of all these, only the Jews, Assyrians, Greeks and Arabs seem to have added important elements to the population. But such Jews as survived the dispersal were

Semites; the Assyrians, though they mixed and shuffled the population to a large extent with their ruthless methods of quelling local resistance by wholesale deportation of cities and tribes from one part of their empire to another, were themselves of Semitic race; and those desert Arabs who, after countless centuries of wandering over the plains and plateaux beyond Jordan, broke like a tide over Palestine in A.D. 634 and wrenched the country from the weakening grasp of Byzantium, were but another section of Semites to be grafted onto the original stock.

The only serious rivals of the Semites in Palestine were the Greeks, but since it is the blood of the peasantry which ultimately determines the type of the population, and the Greeks were essentially dwellers in towns where the death rate was highest, their element rapidly disappeared after the Arab conquest.

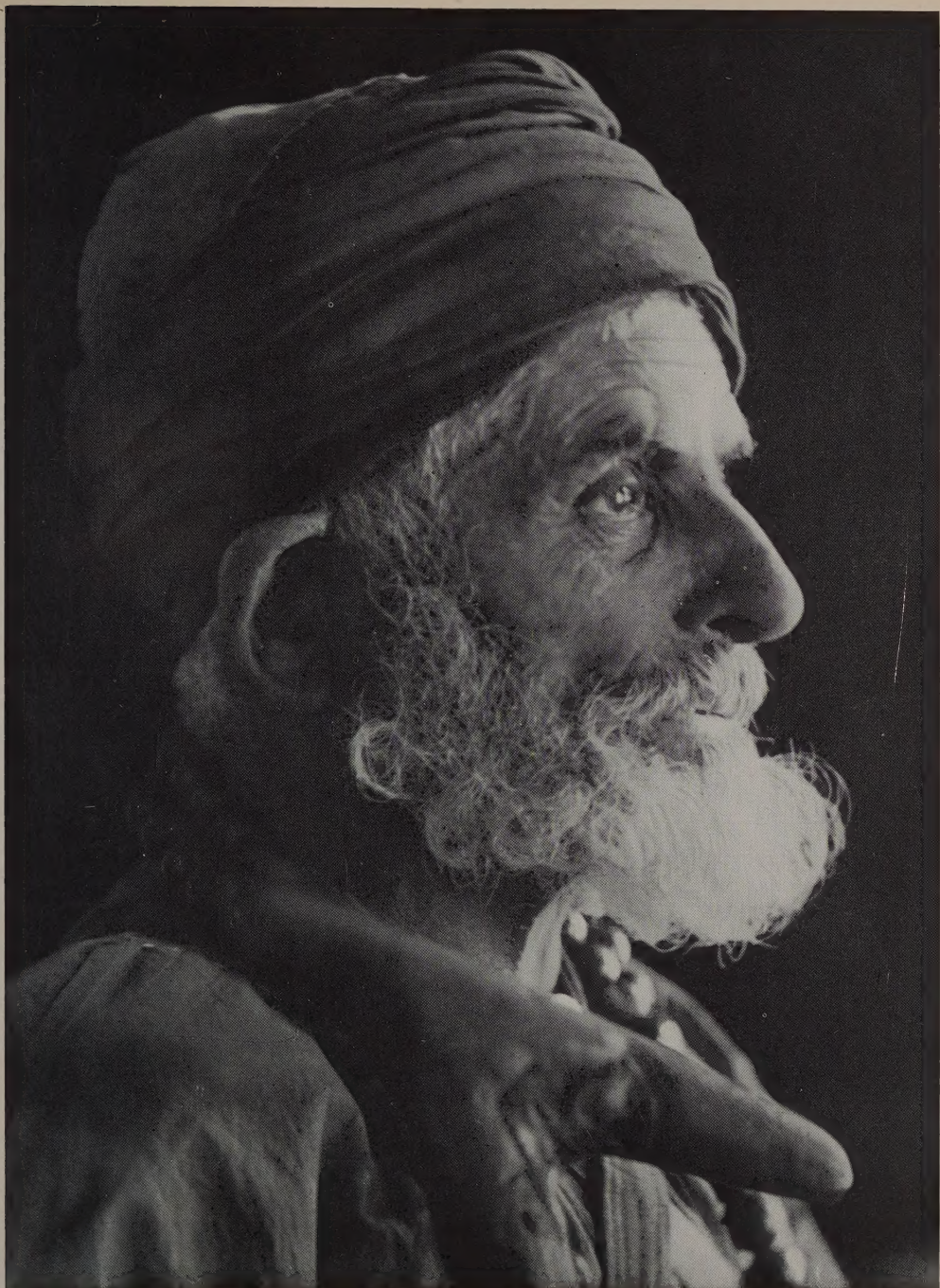
Today the largest element of the population in Palestine is composed of Arabs and Syrians, and by Syrians are meant those descendants of the ancient tribes who, at the beginning of the Christian era, spoke Aramaic—the Semitic dialect of the lands north-east of Palestine, used by the Jews themselves after the Babylonian exile. Nowadays the universal language of this element is Arabic, their religion both Moslem and Christian.

There are 848,342 Moslem Arabs in Palestine, and about 100,000 Christian Arabs, but besides these there are a number of small, immigrant colonies who have drifted into the country and settled themselves in villages within the last hundred years. There are some 900 Circassians living on the borders of Syria and Palestine as well as a community of Bosnians residing within the half-ruined city of Caesarea. An ancient settlement of Magharbeh from North Africa occupies a quarter of Jerusalem and over 4000 Metawileh, who have religious affiliations with Iraq and Persia, inhabit the northern dis-

trict between Galilee and Acre. About 9000 Druses who have migrated from the Lebanon live in the region of Galilee; also a small Persian community of Bahais is settled on the sea-coast near Acre. A tiny unit of 182 Samaritans, the sole quite distinct representatives of ancient Israel, still inhabit the region of Nablus, the Shechem of the Old Testament. They carry on their own mode of living and cling to their ancient beliefs, still offering burnt sacrifices once yearly on Mount Gerizim. Amongst themselves they speak a kind of Aramaic dialect and use an archaic alphabet derived from Ancient Hebrew. The Pentateuch is their gospel and they keep the Sabbath very strictly.

The main bulk of the Moslem rural population is, however, composed of Arabs and Syrians. The Arabs are divisible into two categories, the *bedawin* or nomads and the *fellahin* or settled Arabs. The *fellahin* are cultivators. They are of more mixed stock than the *bedawin* but less so than the Syrians who are relics of all those early tribes that inhabited the country before the Christian era. The Aramaic language gave place to Arabic as the infiltration from over Jordan increased; the races mixed, and today the difference between Arabs and Syrians lies more in their activities. Syrians are primarily town dwellers and agriculturists, settled people of peaceful inclinations: the Arabs are still tribal and warlike, a primitive pastoral people who tend their flocks and plough small bits of arid earth in the manner of Abraham 4000 years ago.

The *bedawin* are men of the desert, born and bred of the wind and the sun. They alone are of pure Arab stock, direct descendants of nomadic tribes which from time immemorial have roamed the open spaces of Arabia. They depend for their existence on their herds and do not cultivate. But their black camel-hair tents are often to be seen pitched right up against the city walls, here today and gone tomorrow. Their tribes are small but



Constantia Rumbold

The Palestinian peasant is the product of a dozen invasions, spread over 2500 years; nevertheless, his blood is mainly Semitic and his religion Moslem, while Arabic has supplanted all other tongues



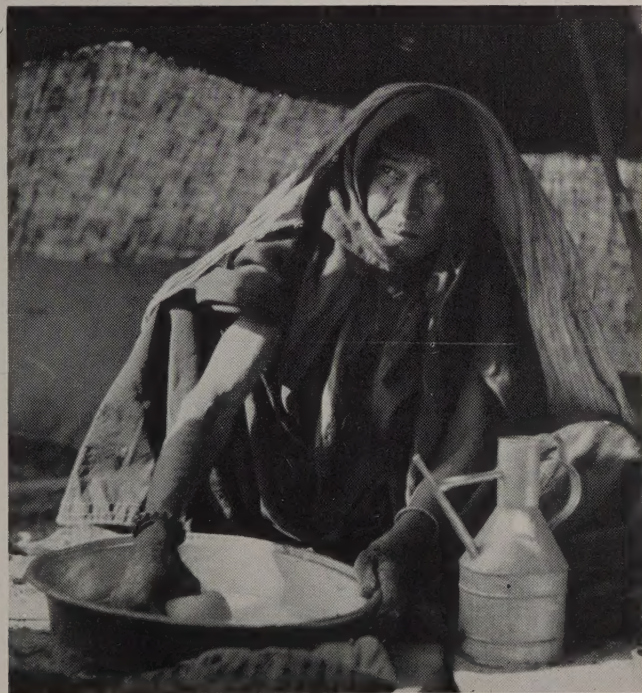
American Colony, Jerusalem

The nomad bedawi tills no land, but depends for existence on his flocks and herds



American Colony, Jerusalem

The only pure-blooded Arabs in Palestine are these wandering bedawin, who never live in a house. Their black camel-hair tents, where the women prepare their humble meals, are to be seen all over the country, even right up against the city walls



numerous and quite distinct. They avoid publicity and pitch their camps as inconspicuously as possible.

No *bedawi* will ever live in a house, but he sometimes inhabits a natural cave in the hillside, or a rock shelter in a wadi which he shares with his family and goats. His watering place is a chance pool, a spring or a cistern which he cuts in the rock and stores with rain water. Poorest of the poor, hardened to extremes of heat and cold, he lives on dates, scraps of Arab bread, goat's milk and the butter which his women make by shaking up that milk in a goatskin bag. On occasions he will kill a goat to provide a feast. His little luxuries are coffee and clear fresh water.

Though springing from the founthead of Islam, the creed of the desert is nevertheless a thing apart. It is a creed shorn of all outward trappings and reduced to its simplest and most vital form. Outwardly the *bedawi* is less religious than the settled Arab, but his whole rhythmic being is bound up in Allah, who is the light above and the earth beneath. Allah rules his daily existence and is accepted as his most natural companion.

Between the two extremes of nomad *bedawin* and settled *fellahin* there are a variety of border folk—*bedawin* of pure nomad stock who have stayed so long in one place as to have become almost sedentary, and *fellahin* living on the edge of the Judaean desert who wander with their cattle and live nomadic lives.

If any English farmer were to find himself in Palestine with intent to settle, and were he to be taken up to a high place to look at the surrounding country, his heart would assuredly sink within him.

He would see a seemingly barren land; a land of merciless limestone ranges, of thin parched soil, a waterless expanse of cracked earth, boulders and stones, covered by a sparse coating of scrub and camel-thorn. He would see a network of dried-up river beds and a tangle of red-brown, treeless

hills. And yet, out of this apparently fruitless soil, the Arab farmer has for centuries dragged a livelihood. It is a constant struggle in summer and winter alike. In Palestine there is no inevitableness; there is no Nile to overflow its borders regularly and irrigate the soil. There are no great rivers, few streams and scanty wells. Man depends on the heavens to fertilize his meagre crops and if the heavens sometimes withhold their rain, there is nothing else within his reach to substitute for it. A rainless year means no harvest. Scarcely a blade will push its way through the parched earth and the Arab will tighten his belt and labour on, undaunted, praying that Allah will in due course send down the beneficent, much-needed rain.

Meanwhile he feeds his family on the little store of grain wrenched from the earth the preceding year, and with that and a few dates and the milk from his black goats, they keep themselves alive until a better season.

This merciless climate with its extremes of tremendous heat and bitter cold has bred a hardy, sinewy stock among the *fellahin*. Centuries of ploughing among the rocks under a scorching sun, and of tending the sheep and goats in the searing winds, have produced a type at once tough and enduring.

Palestine is a little country, in habitable extent no larger than Wales, and the total area of cultivable land is about 15,377,000 *dunams*. (A *dunam* is approximately one quarter of an acre.) Of this area 13,097,400 *dunams* are owned by Arabs and 1,310,000 by Jews. The State owns the remainder, amounting to approximately 969,500 *dunams*, of which 534,466 are leased or otherwise held from the Government by Arabs and 140,636 by Jews.

Thirty-five per cent of the total number of holdings in Palestine average one acre, but since it is wellnigh impossible to live off that area, a very large part of the rural



Karl Gr

The settled fellahin, descendants of many races, dwell in the villages that straggle down the steep hillsides of Palestine, and cultivate the communal ploughlands around them. People and animals mingle in their narrow streets, and little normally disturbs their peaceful, isolated existence

School Films



'If any English farmer were to find himself in Palestine, his heart would assuredly sink within him. He would see a seemingly barren land—

—a land of thin parched soil, a waterless expanse of earth, boulders and stones. And yet, out of this apparently fruitless soil, the Arab farmer has for centuries dragged a livelihood.'



H. B. Sharp

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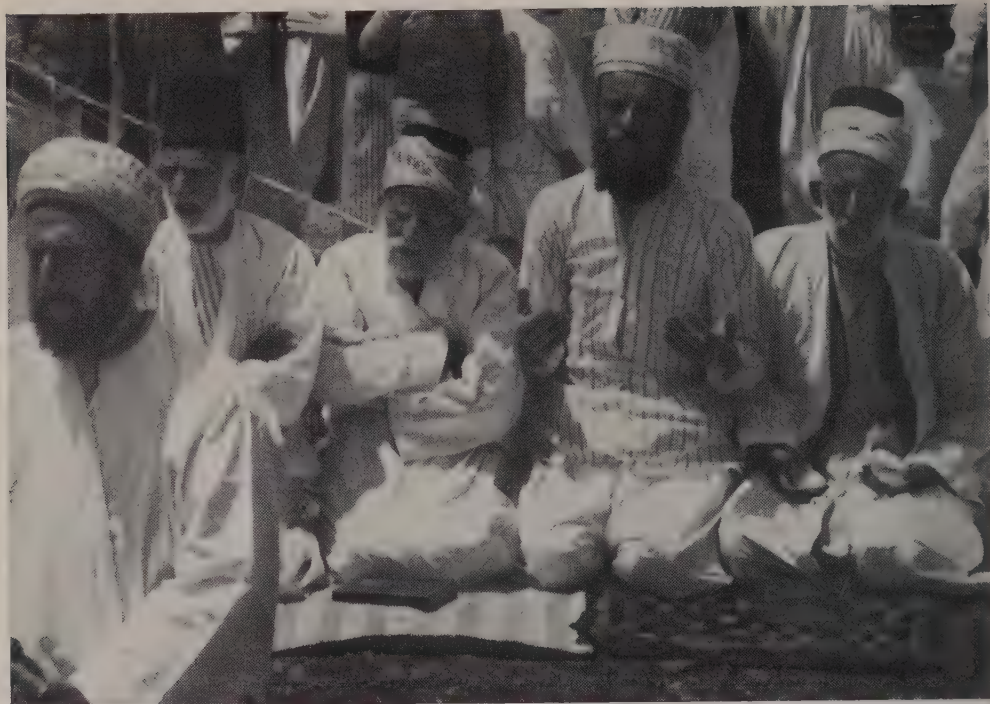


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Nomad or settled, the Arab peasants have sometimes produce enough to bring to market; and with their camels and donkeys they assemble, usually wearing the keffieh common to the whole Arab world, at such ancient places of congregation as the Damascus Gate of Jerusalem (below)

Fox Photos





Kurt Lubinski

Among the minorities of Palestine there exists, at Nablus, a remnant of the Samaritans, who still offer burnt sacrifices on Mount Gerizim. Here they are seen preparing for the hour of sacrifice

population is engaged in other occupations as well. Excluding the holdings of approximately one acre and all the holdings of over 125 acres, the average size of those between the two is eight to ten acres. The big Palestinian landowners, excluding Jews, are chiefly wealthy Syrians who buy up the properties of small Arab farmers unable to pay their taxes. After acquiring the land they leave the farmers to work it and become absentee landlords living in villas in the cities.

There are five categories of land in Palestine. There is *mulk* land which corresponds to freehold property and there is *miri*, property owned by the State but occupied by private individuals who may use it as they please provided they cultivate it or build on it. This land may be sold, mortgaged or leased but not bequeathed by will. On the death of the

holder the *miri* land goes to his heirs or failing them reverts to the State. Most of the land belonging to the villages is of this class. It is usually registered in the names of the head men of the village although it is the common property of all the villagers. No villager holds one particular plot of land continuously. All he can be said to own is a fractional share in all the lands appertaining to his village. Every two or three years a redistribution takes place. Lots in the shape of stones are drawn with great ceremony, very often by a child, and after the plough lands have been divided up and the boundaries marked, each holder ploughs and sows his plot. The whole of the village plough lands is sown with the same crop to facilitate the communal harvesting operations, the usual crops being wheat, barley, durrah, sesame, lentils and beans. A village usually owns

three arable areas generally differing in richness of soil and accessibility, so that, with great fairness, each holder is given a strip of land in two out of the three areas while the third is set aside as fallow each year. This method of farming is not really conducive to great productivity since the temporary holder lacks the incentive to develop his plot beyond bare necessity.

The Arab has no fixed hours of labour. He rises with the sun and works till it sets, but his methods are those of 3000 years ago. His land may consist of a series of

rocky terraces rising steeply on the hillside which he furrows with his wooden hand-plough or it may be a stretch of slightly richer soil in the plain or valley. If he can afford it he owns a couple of bullocks to drag the plough, or if he is from the Hebron district he will use a camel. It is not unusual to see both a bullock and a camel harnessed to the same plough.

Pastures are also communal village property on which graze private flocks and herds tended by communally employed shepherds.

There is another class of land which belongs to the *waqf* or Moslem religious endowments. This land is dedicated to religious and charitable institutions.

Two further types of land are *metruque* or public land dedicated to roads, parks, places of worship or markets, and *mewat* or waste land which is unowned by town or village and which must, according to the law, be 'so far from any village or hamlet that the loud voice of a person from the nearest inhabited spot cannot be heard there'.

For centuries Palestine has suffered from improvident, primitive farming and the Arab, being what he is, with divine philosophy says "*mal'esh*" ("it can't be helped") when a bad year comes, and does not care if his conditions are improved or not. His needs are few and his standard of living very low. He remains the ancient Canaanite, content to scratch the soil for a bare living, sowing his meagre crops by hand, cutting them with a sickle, while his cattle tread them out on the village threshing-floor. When starvation is too imminent, he often delights in a raid and a little banditry on the high road at dusk.

Since the mandatory power took over Palestine much has been done for agriculture, and experimental farms and horticultural stations have been started in many districts. Great attention is being paid also to forestry, as centuries of neglect have led to the total deforestation of some parts of the country. Palestine was once well



Karl Gröber

'Christian Arab women go unveiled. Most picturesque of all are the married women of Bethlehem whose high mediaeval head-dresses and flowing white veils are said to be relics of the Crusading period'



American Colony, Jerusalem

The British administration in Palestine has made special efforts to repair, with plantations of pines and other suitable trees, the deforestation due to centuries of neglect

wooded but today it is bare of trees and large areas are covered with scrub and camel-thorn. The herds of goats which for countless years have swarmed over the land have laid it bare of vegetation, and the larger trees have been cut down for firewood and never replaced. Much timber, too, was used during the war for military purposes by the Turks. The forestry department has been active since 1920 replanting trees and already there are groves of well-grown Aleppo pines, cypresses, eucalyptus, acacias, carob trees and olives.

Fruit farming is one of the main branches of Arab agriculture. The Arabs have always depended to a large extent on their olive crops and the terracing of some of the groves is said to date back to Roman days. The population of the plains and

sea-coast cultivate mainly citrus fruit, and half the orange, lemon and grape-fruit plantations of the country belong to the Arabs. The other half is owned by the Jews. Orchards of apples, pears, apricots and peaches are being started, but few of these trees are over five years old. Bananas flourish chiefly in Jericho and Jaffa, and grapes are cultivated for wine-making, largely in the south.

In recent years there has been an increasing demand for education among the rural population and since 1920 the Government in co-operation with the villages has been able to start a large, but still insufficient, number of elementary village schools. Peasant children depended previously for education on Moslem religious instruction, which taught them little beyond the recital of the Koran,

and the Christian Arab children received some elementary education from missionary bodies. Under the new system, the building and equipment is furnished by the inhabitants of the village and the Government appoints and pays a teacher. Although lack of Government funds has slightly retarded progress, there are over 250 Government schools in existence today and several privately run Arab ones as well. Schooling takes four years and most schools have an acre of garden where pupils are instructed in agriculture.

Village life in Palestine is much the same as village life anywhere else. The village elders and the *mukhtar* or head man congregate in small groups in the main street to smoke their hookahs and talk. They sit on low stools against a hot, sunny wall, clad in flowing saffron robes and wearing turbans or the Arab *keffieh*. The younger

men going about their business in the village or the fields, with their slight figures, pale faces and dark beards, are completely Biblical in appearance. They still wear the traditional *galabieh*, the long straight belted garment of striped material which was worn in the time of Christ. Nothing, indeed, seems altered since those days. In every village there is a Joseph carpentering in a back street, a Mary perched on a donkey carrying a child, and in Galilee, Peter, and James and John still push forth in their boats at sunset and net the small flat fish called Peter's fish.

The villages are mostly wedged in clefts in the hills or straggle down steep slopes, tier upon tier of small, square, flat-roofed dwellings, dazzling white with arched windows like pairs of black eyes for ever watching. Inside the house is a main dwelling-room, and down three steps at a



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'Fruit farming is one of the main branches of Arab agriculture. The population of the plains and sea-coast cultivates mainly citrus fruit and half the plantations belong to the Arabs'

lower level is a corner for the animals, the goats and hens.

The women, heavily veiled in white, go backwards and forwards to the village well, moving superbly with earthenware jars on their heads or, as is now more often the case, a kerosene tin balanced equally elegantly. The well, which is sometimes a little outside the village, is a great centre for feminine gossip and much of the laundry is done there as well.

Christian Arab women go unveiled and wear bright-coloured tunics embroidered in different shades of red. Most picturesque of all are the married women of Bethlehem, whose high mediaeval head-dresses and flowing white veils are said to be relics of the Crusading period. Under these coifs they wear their dowry of gold coins tightly bound to the head.

Every village has its mosque and usually the tomb of some holy man as well. The

Arabs are very strict in their religious observances and it is by no means always easy to get into a mosque. The fast of Ramadan is observed very carefully and although they may be labouring all day, not a drop of water or bite of food passes their lips from sunrise to sunset. Even the offering of the much-coveted cigarette is refused during that period.

Arab Palestine is fascinating because it is untouched by the 20th century. Life in it goes on as it did a thousand years or more ago. The wild, bare hills are beautiful, holding every colour in their soil. Galilee, like a silver mirror in the north, is lovely in its peacefulness. Even the strange wilderness by the Dead Sea has an extraordinary fascination. And everywhere, Biblical figures are bending over their ploughs, scattering the grain, leading their flocks against the skyline, content to carry on their simple primitive lives in



Constantia Rumbold

In a land that is holy to Moslem, Jew and Christian alike, the Arabs maintain their religion with great strictness: not for them the modernity that is secularizing other Moslem countries



American Colony, Jerusalem

'Everywhere Biblical figures, content to carry on their simple primitive lives in the same way as their ancestors before them . . . Peter, James and John still net the small fish called Peter's fish . . . The women go backwards and forwards to the village well, moving superbly with earthenware jars on their heads, or a kerosene tin balanced equally elegantly'



Constantia Rumbold

the same way as their ancestors before them.

But Jewry has brought modernity and civilization in its train and the Arab peasants are bitterly opposed to the relentless encroachment of these powerful forces. They do not care whether they benefit or not from the civilizing influence of the Jews. They realize that the Jew, with his modern systems of agriculture, his modern implements, his industry and his brains, gets more out of the land than they can ever do. They realize, too, that in many ways they benefit by the contact, but they do not care. They are content with a far lower standard of living and they have a strong possessive feeling for Palestine and are afraid of being crowded out.

The Palestine peasant, hybrid though he is, and so mixed in ancestry compared to the true Arabs, has nevertheless many of the same qualities and defects. He is childlike and utterly improvident, a fool in many ways, cunning in others. He is a swashbuckler with great natural dignity and charm of manner. And he has a tremendous sense of humour. But he cannot resist the lure of money and one of the sources of grievance in the rural districts comes from the fact that the Arab farmer sells his land to the Jews for a good price which he subsequently squanders on a wedding feast and then finds himself after a few months both landless and penniless.

The political consciousness of the peasant was never seriously aroused until lately, their standard of education being far too low. When not occupied with the day-to-day business of actual existence, their chief hobby and relaxation was litigation. There is nothing an Arab loves more than a lengthy lawsuit over some trivial subject, such as a camel or a goat, which will last several years and eat up

all his capital. Politics he left to the townsfolk and the politicians.

But now it is different. Politics have been forced on him by actual contact with existing problems. Since the land problem has affected him more nearly and the vital question of sharing Palestine with the Jews has loomed large on his horizon, the Arab peasant has developed a strong nationalist feeling and there are few even in the more remote villages who do not now discuss the burning political difficulties of the day.

There are extremists and fanatics for every cause; but the great bulk of the rural population has no great animosity towards the Jews as a race, only against Zionism and the National Home. They have discovered that the most effective means of expressing this hatred is by murder and violence against Jews as a whole and the more fanatical among them have resorted to this method.

There is no peasant leadership and no co-ordination in these attacks. They are isolated instances. The Mufti of Jerusalem is the spiritual and political head of the Palestine Arabs and they have had no other leader than the daring Fawzi Kaukji, who led the guerilla warfare for a time but whose exploits were curtailed by enforced flight from the country.

There has always been a Jewish minority in Palestine with which the Arabs have mingled harmoniously. And so long as the Jews were few in numbers Arab cultivators worked side by side with them amicably enough. But the bugbear of Zionism has assumed terrifying proportions and their fear of shortly being swamped and gradually squeezed out by the Jews is responsible for the violent and uncompromising attitude of the Palestine Arabs today.



Martin Hürlimann

The cross of the Knights of St. John, against a mountain background in an Innsbruck street



Hans Retzlaff

'The Cross' in the little town of Heitersheim on the edge of the Black Forest
A rococo stage coach on an inn sign at Schwaz, an old town in the Tyrol

Martin Hurlimann





Hans Retzlaff

'The Bull', a delicate sign at Friesheim, near Germany's western frontier, not far from Strasbourg

'The Sun' at Krotzingen, another town on the lower slopes of the Black Forest, in western Germany



Hans Retzlaff



Hans Retzlaff

At Biberach (between Ulm and Lake Constance) is a specially attractive sign—'The Plough'



'The Stork' at Freiburg im Breisgau, the chief town of the Black Forest



L. H. H. H. H.

The 'White Lamb' brewery at Erlangen, in Bavaria
'The Prince' inn at Weissweil am Neckar

H. H. H. H.





A brewery sign at Rothenburg ob der Tauber, Bavaria



'The Eagle' at Gutach in the Black Forest

Arctic Summer

by P. G. MOTT

The idea that Greenland can ever be too hot for comfort seldom enters most people's heads; nor is it easy to conjure up any but the haziest image of a summer scene in 'the world's largest island'. From one of its hitherto unexplored regions Mr Mott and his companions brought home not only results of interest to science, but also impressions of unforgettable scenic grandeur that he enables us to share without experiencing the hardships amid which they were gathered

MANY thousand years ago practically all the northern countries of the world were covered with a vast ice-sheet. Owing to astronomical changes which have affected the climatic conditions of the earth, this terrestrial ice-cap has slowly receded towards the arctic regions. A remarkable remnant of the last great glacial epoch still exists today and bears, somewhat paradoxically, the name of 'Greenland'. The name originated from the old Norse settlers who, ten centuries ago, first reached its shores under the leadership of Eric the Red. The value of propaganda was apparently realised even in those days, since in order to attract further immigrants, Eric the Red and his companions called their new-found home, Greenland.

The largest island in the world, Greenland extends from latitude $59\frac{1}{2}^{\circ}$ (that is just north of the northern limit of Scotland) to latitude $83\frac{1}{2}^{\circ}$, which is only 450 miles from the north pole. Its total area is 827,300 square miles, or about eight and a half times the size of the United Kingdom. Eighty-five per cent of this area is covered by an immense ice-plain, which reaches a height of 9000 feet at its centre, and in places is as much as two miles in depth. Between the 'Inland Ice' and the sea there intervenes a narrow strip of ice-free country which is never greater than 120 miles in width. In parts even this strip does not exist, the glacier extending right down to the sea, where in summer it constantly breaks off, forming the countless icebergs which are such a menace to shipping in the north Atlantic.

From the map it can be seen that on the west the coastal strip is widest near the

latitude of the Arctic Circle ($66\frac{1}{2}^{\circ}$), and apart from Peary Land in the far north there exists here the largest area of exposed country in the whole of Greenland. Cutting through the centre of this region is the great Søndre Strømfjord, one of the longest and finest of Greenland's innumerable fjords. North of the Strømfjord the ice-free land is over 100 miles wide, while to the south the ice has also receded to a large extent; but in doing so it has left behind a glacier, the Sukkertoppen, approximately 900 square miles in area and 6000 feet above sea-level, which is hemmed in on all sides by the mountains. The type of country in the district varies considerably, from the rugged alpine ranges, providing some of the most magnificent coastal scenery in the world, down to a mild undulating plateau-land from which the inland ice has most recently retreated.



East of the Sukkertoppen Glacier, referred to above, lies the 'Tasersiak', or 'Big Lake', a long narrow stretch of water, over 30 miles in length but scarcely ever more than a mile in width, which flows along the edge of the inland ice. The lake has been known to exist for over half a century, but until last year it has remained unexplored, visited only by a few Greenland hunters who go there on foot in search of caribou.

To reach the Tasersiak, and to map the country dividing it from the Strømfjord were the main objects of the two expeditions sent out by the Oxford University Exploration Club during the summers 1935-6. Owing to a variety of causes, the chief of which was lack of time, the 1935 expedition failed to reach the lake or to penetrate very far inland. In the spring of 1936 a second expedition was therefore organized which planned to make a fresh attempt on the Tasersiak, and to further the survey work carried out in the previous

year. In addition, there was attached to the expedition a biological unit, which worked independently of the survey party while on the ground. The personnel consisted of five surveyors, W. R. Plunkett, J. C. G. Sugden, T. Kershaw, E. Etienne, J. Beard and myself; and three biologists, J. Gibson, H. G. Vevers and D. Steven.

In this article will be found a general account of the experiences which befell the six surveyors during their outward trek to the lake, over unknown country, the return journey over the edge of the glacier, and finally a description of what is claimed to be the first crossing ever made of the Sukkertoppen ice-cap. The underlying intention is not to describe in detail the work of the expedition but rather to convey some idea of the country and its features, which, during ten weeks of summer travel, provided a background full of variety and fascination.

Holstensborg, like all Greenland settle-





J. C. G. Sugden

All down the coast from Holstensborg and up the Søndre Strømfjord, the mountains rise sheer from the sea. With 100 miles of such majestic scenery, Greenland introduced itself to the expedition

ments, consists of a cluster of brightly painted houses, built almost entirely of wood, and nestling on the sheltered side of a coastal reef. We spent a day there checking and sorting the two hundred-odd cases of provisions and equipment and transferring them on board the *Nakuak*, a small motor fishing-smack which was to take us the last part of our journey. In the afternoon of June 21, watched by the usual gay crowd of children and loungers, we sailed, waving our farewells to the three biologists whom we were not to see again for eleven weeks.

Our route lay due south for sixty miles through a maze of coastal reefs. One moment we were bumped and tossed by the open sea, and the next running smoothly behind the shelter of a protective skerry. All down the coast the mountains rise sheer from the sea, with the clouds

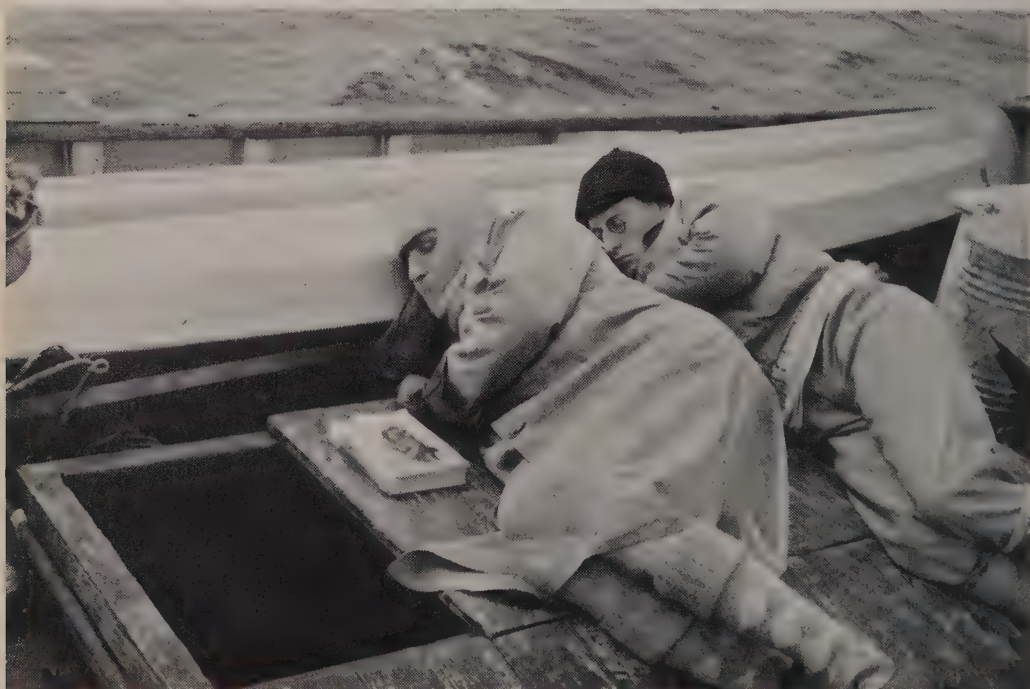
lying in thin streamers beneath their snow-capped peaks. At intervals great bays and fjords cut inland revealing further ranges beyond. As we reached the narrow entrance leading to the Strømfjord the wind, which had been fresh all day, subsided. The sea was so calm that the perfect colourings of sky and mountains were reflected in its mirrored surface. At midnight the sun was just visible above the horizon, looking like an incandescent ship which had passed by leaving a liquid trail of fire in its wake. The mouth of the Strømfjord is blocked by an island, known as the 'Stopper', and so narrow is the channel dividing it from the mainland that it was only with some difficulty that the *Nakuak* was steered safely through.

It was noon when we came to anchor off a wide inlet on the southern shore, fifty miles up from the mouth of the fjord. The



E. Etienne

About half-way up the Strømfjord an inlet, leading to the interior, penetrates its rocky walls, and this the fishing-smack conveying the party entered



E. Etienne

Meanwhile, the members snatched a final nap before their labours began



E. Etienne

The inlet, at low tide a series of mud-silt flats, forms the mouth of a swift glacial river near which, beneath a towering cliff, the expedition established its base-camp

point is known as 'Sarfartok'—'place of many currents'—and provides the delta mouth of a swift glacial river which flows into the fjord there. Although so far from the coast, the tidal flow is considerable and at high water the tide advances over two miles inland, while at low water the estuary consists of a series of mud-silt flats interspersed with a network of shallow channels.

We determined to attempt a landing on the north side of the estuary, where the main bed of the river existed, since the year before the southern shore had proved unsuitable for camping. Like most Greenland rowing-boats, the *Nakuak's* dinghy was a clumsy affair with oars hewn from rough boards and thole-pins which were constantly breaking off. The distance to the land was nearly a mile, and the current against us strong, so that we had the greatest difficulty in getting the first load ashore. After one more trip the tide

began to ebb, and it became impossible to row so awkward a craft against a combination of tide, wind and river. We managed, however, to get the remainder of the stores as far as a small cove which lay at the nearest point of the estuary where it joined the fjord, and after ten hours of unceasing work we at last had everything ashore. Surrounded by a chaotic pile of provision cases, which lay scattered over the rocks, we watched the departure of the *Nakuak*. As the little boat chugged away down the fjord, we realized that at last preliminaries were over and the real work about to begin.

The base-camp was pitched on a gentle slope beneath a monstrous cliff, which towered almost vertically above, while a few feet below the Sarfartok River swirled past at a great rate. Only three days after our arrival a heavy rock-fall occurred which was prevented from reaching the camp by a protective rise of ground, but

nevertheless succeeded in diverting the stream supplying us with drinking-water into a new course, which included the whole area of our camping-site. Fortunately we made the discovery in time, and by digging deep dykes we were able to save the tents from being flooded out.

The first part of the inland journey lay up a wide glacial valley enclosed by high cliffs of greyish-brown gneiss, banded with dark veins of dolerite, which gave a curious streamlined effect to the landscape. The Sarfartok River meanders down the valley from one side to the other, having cut for itself a channel, in places eighty feet in depth, in the thick layer of silt which reveals the former presence of a lake.

Before reaching 'The Island', a mountain standing majestically apart from the surrounding ranges, thirteen miles further east, the Sarfartok is joined by a smaller stream of clear transparent water, there being a strange contrast at the junction of the two rivers where the clear stream meets and is swallowed up by the cement-coloured silt which renders the Sarfartok opaque. 'Clearwater' flows down an extension of the main valley on the north side of The Island, while the Sarfartok emerges from the mountains to the south.

We had brought with us two collapsible rubber-canvas boats such as are used for pleasure cruising in Germany. Built of a light wood framework with an outer skin made of several thicknesses of reinforced rubber, they are remarkably durable for their weight, and provide the ideal craft for rapid travel over rough country where long portages between lakes and rivers are frequent.

Although treacherous and unreliable, the Sarfartok River provided an obvious solution to the problem of transport for the thirty-one cases of provisions together with a large bulk of equipment which had to be taken on the journey. Into each boat was packed the weight that three men were capable of carrying. It needed only two

to haul the boat upstream. A double tow-line was used, one end being attached to the bows, and the other half-way along the gunwale, so that it was possible to steer from the shore.

Our first real difficulty developed when it became necessary to cross from one bank of the river to the other at a point just below some particularly bad rapids. Two-hundred feet in width, the river rushed past at a terrific rate, and to have attempted to cross with a heavily loaded boat would have been both dangerous and hopeless. After several vain attempts to get a line across, Etienne managed to paddle over with a light ball of string attached to the bows of the canoe. In this way we eventually spanned the river with the whole of our climbing-line and an extra length of steel-cored rope which had been brought in case of emergency. One end of each rope was fastened to the boat and the free ends anchored on either shore. A ferry service was then begun from one bank to the other, and the whole of our gear, weighing over half a ton, transferred across.

After a short portage the next stretch of towing began to the mouth of Clearwater River. Here the banks were over forty feet high, composed of loose glacial silt on which it was impossible to get a firm foothold. There was also the constant danger that such high terraces of loose sand might collapse without warning. To overcome the difficulty of these banks we used a hundred-foot tow-line with which it was possible to manœuvre the boats from the top of the terrace. There were, however, frequent bends where the stream formed backwaters, and at such places it became necessary to hold off the boats with a paddle in order to prevent them from running aground. When emerging again into the main stream the full force of the current would catch the canoe with a jerk of such power, that, even when fully prepared, we were usually pulled off our feet.

During the whole of this period the



P. G. Mott

Looking inland, towards the party's unexplored destination, from above the base-camp



From the base-camp the way lay up the Sarfartok River. Stores were hauled upstream in collapsible boats on double tow-lines, 100 feet long, from the top of the steep silt-banks



On the loose silt at the base of these banks—often 60 or even 80 feet high—foothold was too poor for hauling; but awkward corners sometimes had to be overcome by descending to water level and wading in



Crossing the river, at a point where it was 200 feet wide and particularly rapid, was a serious problem. After several attempts, first a string, and then ropes were taken across, and finally the party's whole gear was ferried over

temperature was exceedingly high; for three weeks the thermometer seldom registered below 85° F. during the day, while on one occasion it reached a maximum of 90° at six o'clock in the morning. Packing loads and towing in this heat would have been unpleasant enough in any case, but it was made doubly so by the mosquitoes. They came in vast swarms and never ceased their activity for one instant, night or day. It was imperative to wear a veil at all times, and to protect arms and legs as well from the persistent onslaught of these pests. They made life at times unbearable, and did much to impair our work, our sleep and our tempers!

Before reaching The Island we parted company from the Sarfartok and followed Clearwater up the main valley. Not being under the direct influence of glaciers, Clearwater has a reasonably consistent flow with the result that a thick, and comparatively high, growth of willow flourishes on both banks. After the speed and turmoil of the Sarfartok, it was at first a great relief to camp beside the gentle waters of the new river; but our hopes of an easier time were soon disappointed. For two days the boat party forced their way along the banks, up to the knees in bog, with the tow-line continually caught up in the bushes, and enveloped in clouds of insects which emerged from the disturbed undergrowth.

Altogether our experiences with rivers had been none too pleasant, and we were not sorry when the time came to give up boat work and to make our way southwards overland. Three strenuous days were spent in relaying loads up to the top of a ridge of hills two thousand feet above the valley. On the third day we camped on the banks of a delightful little mountain torrent, which flowed from a freshwater lake near by. The place was in many ways reminiscent of Dartmoor or parts of Scotland, with rolling heathland stretching up to high hills on all sides. In the far distance the presence of the ice-cap

was revealed by a series of dazzling white patches which were visible between the mountains.

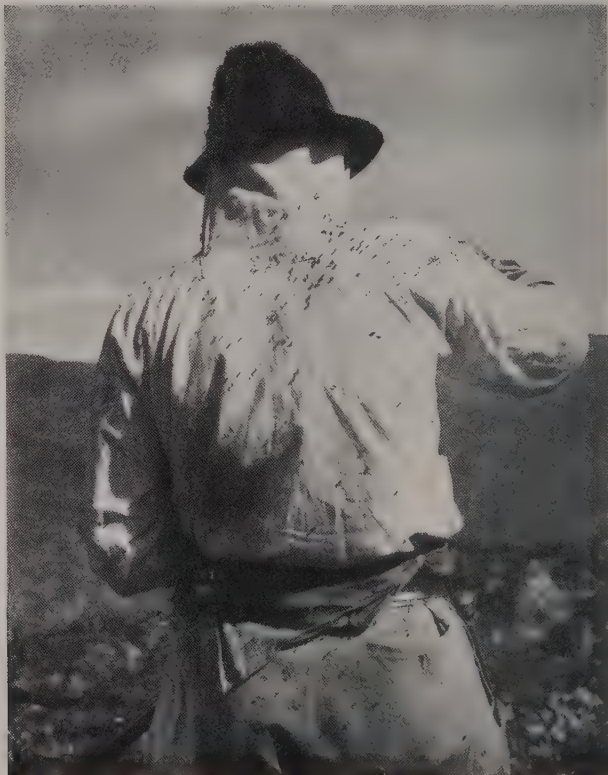
As the country ahead was completely unknown and a trek in the wrong direction might have spoilt our chances of reaching the lake, we decided to make a rapid reconnaissance journey to discover the exact position of the Tasersiak. On July 17 three of us set off with the bare minimum of equipment and food enough to last three days. We followed a course due south of the camp over a dreary tract of rock-strewn country covered with patches of frozen snow, and almost bare of vegetation. This came to an end in an abrupt descent to a deep valley at the bottom of which the Sarfartok had cut for itself a canyon of spectacular proportions divided up into two stretches at right angles to one another, the total length being about seven miles. Sheer rock walls, 800 feet in height, hemmed in the river, which rushed along in a wild, seething fury, filling the air for miles with its deafening roar. In places the width of the gorge was barely thirty feet, while at its source the river was later found to be half a mile across. Besides this, every single stream in the district eventually drains into the Sarfartok, so that some idea of the gigantic forces at play in the canyon may be imagined.

Progress now became more difficult and it took two hours' hard scrambling to reach the bottom of the next valley. There appeared to be one final range, on the far side of which we hoped to find the lake. But this range proved the most formidable obstacle of all. After climbing for three hours over an endless series of escarpments we were finally forced to camp for the night at a height of 4000 feet on a small patch of moss in the middle of a sea of boulders. In the morning we found that, only just beyond, this rocky wilderness finally came to an end. Once again we looked down on the Sarfartok, but in a much milder form than when last seen. On the far side, the valley sloped up steeply to the edge of the



E. Etienne

A muster of stores beside the Clear-water River, up which the party travelled after temporarily leaving the Sarfartok. The temperature was exceedingly high during this part of the journey—seldom below 85°—and swarms of a particularly large and offensive brand of mosquito made veils and every available body-covering imperative



J. C. G. Sugden



E. Etienne

The Clearwater, not being under the direct influence of glaciers, has a reasonably consistent flow and willow thickets flourish on both banks (above). The country round Lake Hopeful (below), discovered by the party, is reminiscent of Dartmoor or parts of Scotland with heath-covered slopes stretching up to high hills



E. Etienne



E. Etienne



E. Etienne

River transport was now no longer possible. Stores, packed in cases, had to be carried over rough country. The party was aiming for Taser-siak, a lake believed to exist, but hitherto unexplored.

A rapid reconnaissance journey was made to decide its exact position, in the course of which a deep canyon (left) was discovered—seven miles long, with sheer rock walls 800 feet high. Through it the Sarfartok River rushes, ‘filling the air with its deafening roar’



P. G. Mott

Into the Sarfartok River an imposing glacier reaches down from the Sukkertoppen ice-cap (which the party later crossed), ending in a cliff of ice

ice, and a few miles away a magnificent glacier reached down to the river, where it ended in a cliff of ice.

The existence of the lake was still in doubt, although eastwards we could just make out the glitter of a stretch of water. In an hour we arrived at the bottom of the valley, and here at last our hopes were fulfilled, for we found that the Sarfartok widened out into the beginnings of a lake, which could be none other than the Taser-siak.

Six miles from its western limit, the south shore of the lake opened out into a valley, the scenic beauty of which has been claimed as the finest in the whole of Greenland. The valley was of peculiar interest, since it divided the Sukkertoppen Glacier completely from the main inland ice; it had formerly been supposed that the two were connected, and that the glacier was merely an arm of the great ice sheet.

Early the next morning we began the

return journey, and after thirteen hours' hard travelling arrived back at our old camp. We had located the lake: the next task was to transport food and equipment over the seventeen miles of rough and mountainous country which lay in front, and in addition to make a map of the whole district *en route*.

In spite of fog, rain and cold—the last not entirely unwelcome as it meant an end of the mosquito pest—we managed to reach the lake in ten days with enough food for a further fortnight and the whole of our survey and camping paraphernalia, and—most important—a boat.

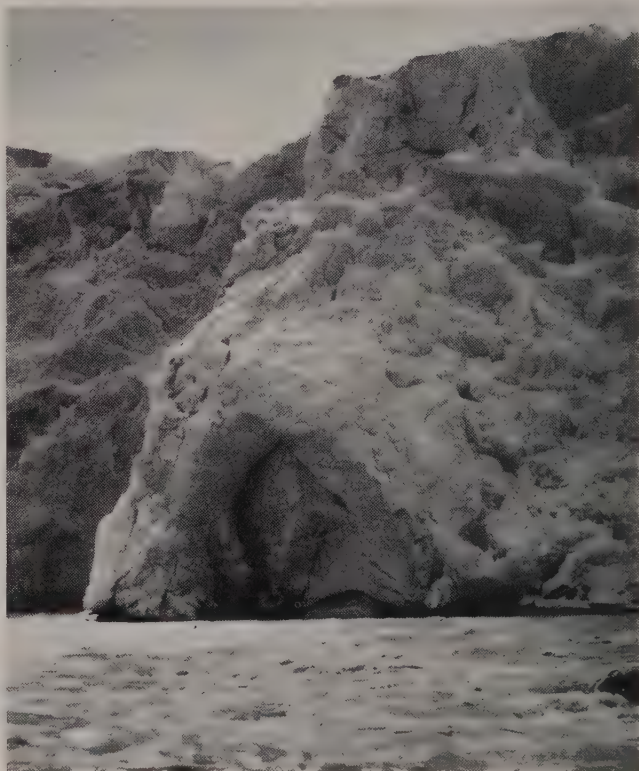
A week was spent in mapping and reconnaissance work round the western end of the lake. We discovered that it would be perfectly possible, and probably easier, to return along the edge of the ice and approach the base-camp from the south. It was therefore arranged that four of us should go back this way, while it was



E. Etienne

Tasersiak, the 'Big Lake' — source of the Sarfartok River, at this point a mile wide— was explored in a boat carried from the last camp. The party found that a valley separates the Sukkertoppen ice-cap from the inland ice (seen in the distance above), with which it had previously been thought to unite.

Then they returned down the Sarfartok to where the blue-green ice-cliff of the glacier, 150 feet high, crumbles into the river with a noise like gunfire



E. Etienne



E. Etienne

Over the glacier, along the edge of the Sukkertoppen ice-cap, a route was found back to the base-camp. The surface of the ice-cap, like frozen waves, is here about 4000 feet above sea level, and clouds can be seen (below) 'boiling up' from the Tasersiak valley



J. C. G. Sugden

necessary for two to take the old route in order to clear the dumps of food and gear left behind.

On August 7, Sugden, Plunkett, Etienne and I started for 'home'. After crossing the lake, the boat was dismantled and, heavily loaded, we made for the edge of the ice. At close range the glacier was a remarkable sight. Owing to the steepness of the slope the ice had formed fan-shaped seracs, grouped in tiers one above the other. Below these the glacier dropped to the river in a vertical cliff 150 feet high. Every few minutes, with the roar of a battery of guns, a section of ice would calve off and crash into the river where it broke into a thousand fragments.

On its eastern limit the glacier had formed the half of a bowl, which proved a suitable place to begin the ascent as the surface there was firm and uncrevassed. After a steep ascent we reached the top and then struck diagonally across the main arm of the glacier. Compared to what we had been used to, it was easy going, the only obstacles being rapid streams which rushed madly, helter-skelter fashion, down snake-like channels in the ice. Often these melting rivers suddenly disappeared into the depths of a crevasse, and one could hear them rumbling far below at the base of the glacier.

On the far side we chose a camp site situated under the shelter of a huge boulder on the edge of a delightful little lake full of small icebergs which glistened and sparkled in the evening sun. After two days spent at our camp under the boulder, we moved to the summit of a mountain which emerged from the edge of the ice about five miles farther west. On the way we encountered some exceptionally beautiful crevasses, in the depths of which stalagmites of fantastic shapes glittered like cut emeralds.

After seven weeks' absence we finally reached the base-camp on August 13, having completed a map covering about five hundred square miles of country.

There still remained three weeks before our return to Holstensborg.

During the latter part of the survey we had observed a distant mountain, the top of which appeared well above the horizon of the Sukkertoppen Glacier, like a giant pyramid on a frozen desert. From a study of the Admiralty Chart there appeared to be a peak called 'Taterat' situated at the head of the main arm of Evighed's Fjord, which corresponded roughly with the calculated position of our mountain. As we had time to spare we determined to make a crossing of the Sukkertoppen ice-cap in the hope of reaching the mountain, Taterat, and of investigating the nature of the country on the far side of the ice. We made the distance from the base-camp to be approximately forty miles, three-quarters of which would be over the ice-cap.

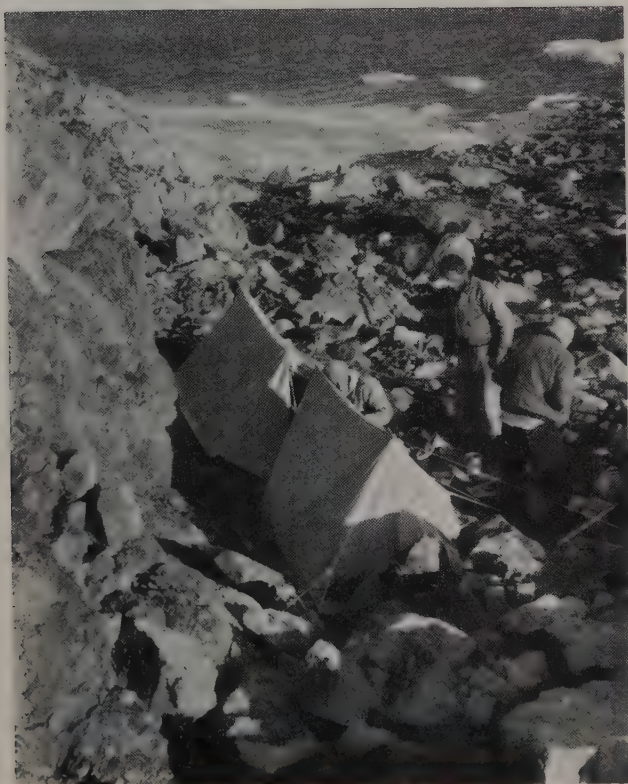
The first day was spent in reaching the edge of the glacier, which involved a climb of 4000 feet. By the middle of the next day we had left the land far behind. Owing to the combination of a hot sun and no wind the surface of the ice was in the poorest possible condition. Everywhere were slush pools two or three feet deep, covered only by a thin layer of ice, which gave way beneath the pressure of one's foot. It was rather like wading through an endless succession of rabbit holes, with the added unpleasantness that each hole was full to the brim with ice-cold water.

By the evening we had reached the edge of the snow-line and found ourselves at last on a clean, crisp surface. No sooner had we camped for the night than a low mist descended, blotting out every landmark. It gave us an eerie feeling to be surrounded on all sides by an endless expanse of white. For the first time we experienced the absolute stillness of the ice-cap, where no living creature exists and not even the sound of running water disturbs the silence.

The temperature, which had been high all day, dropped twelve degrees below freezing point. In spite of having no equip-



E. Etienne



E. Etienne

'On the far side we chose a camp site situated under the shelter of a huge boulder on the edge of a delightful little lake full of small icebergs which glistened and sparkled in the evening sun'

ment we managed to keep perfectly warm, the secret being to concentrate spare clothes underneath one's sleeping-bag, rather than on top. When pitching the tent we laid first a thin ground-sheet on the snow, on top of this a light rug, then the tent with ground-sheet attached, and finally a thick rug to isolate us from the floor of the tent. In the morning we would find that moisture had condensed on the bottom of the thick rug, but the top side remained dry, and we were never cold even though our sleeping-bags weighed only two pounds.

In the morning we found to our consternation that we were still surrounded by a thick mist, which reduced visibility to a quarter of a mile. There was no time to wait for the clouds to rise, so we set off on a compass bearing, continually looking back to keep a check on our tracks in the snow. By midday we had reached a height of nearly 6000 feet, which we judged to be the highest point of the cap. The condition of the snow was average: with skis or snow-shoes it would have been easy going, but we had not come equipped for this type of work.

Before lunch the weather showed signs of clearing, and at last the cloud lifted for a minute. Dead on our course there loomed a great mountain, higher than any we had yet seen. After making sure of our bearings, we set off again full of confidence and at a quickened pace, aided later by the wind, which rose to gale force, driving everything before it in a hail of minute snow particles. After some time the clouds again lifted revealing an imposing range of snow mountains which gained in grandeur as we approached. Since it was growing late and the wind was gaining in force, we decided to go no further and pitched camp at the head of a snow-covered glacier three miles away from the foot of the range.

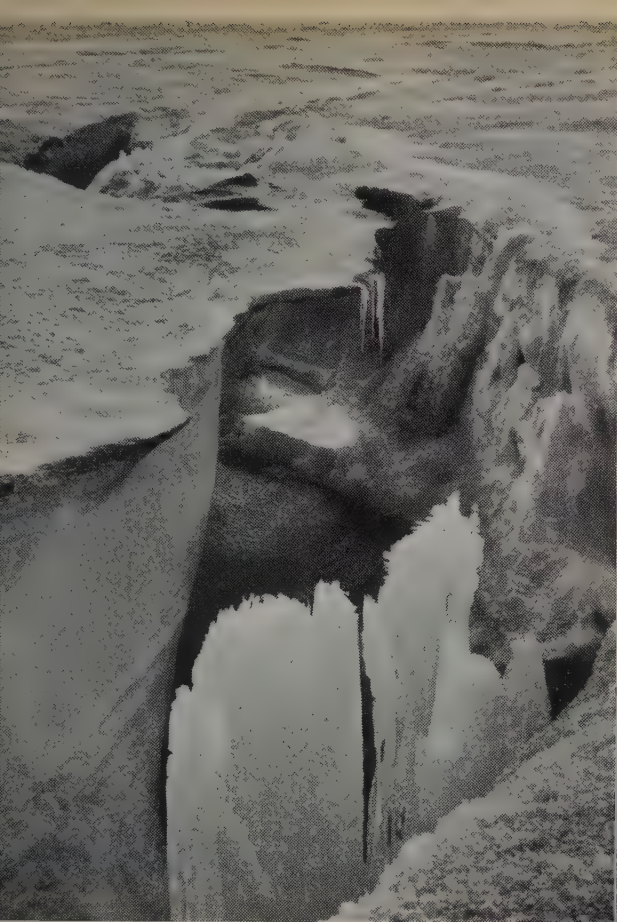
Some of the peaks looked as if they had been cut out of white cardboard to decorate the backcloth of a stage. South-east a

vast ice-dome towered above everything without a vestige of rock showing for two thousand feet below its summit, while beneath the camp a number of glaciers extended into a great bowl from which there was no visible outlet. In the evening, when it grew dusk, the tops of the mountains turned pink, and the Northern Lights flickered above in ethereal wisps of green light. It was bitterly cold with a driving wind and the temperature down to 12°. In the morning, we woke to find the inside of the tent covered with a thick layer of hoar-frost due to the warmth of our breath.

There remained enough food for three days. We calculated that it would take us less than this to make the return journey, so we determined to push on for a further mile or so in the hope of getting a glimpse of Evighed's Fjord. Leaving the tent pitched, we started up the next rise. It was a perfect morning, with little wind, clear skies and a dazzling sun. As we topped the rise further ranges came into view, and finally we found what we had hoped to see: six thousand feet below lay the main arm of Evighed's Fjord, stretching in a brilliant blue ribbon to the sea. The cliff-sides of the fjord rose thousands of feet, ending in ragged pinnacles of bare rock, like the castellated battlements of some giant fortress fallen into decay.

From where we stood a glacier drained down to the fjord, ending in a delta a mile in width. In the centre of all towered the impressive bulk of Taterat. The immense size of the mountain dwarfed the whole of the surrounding ranges. Its significance was even further accentuated by the fact that on two sides it rose from sea level to its full height, which we estimated to be in the neighbourhood of 8000 feet, making it probably the highest peak in the whole of West Greenland.

The sun was in its zenith before we tore ourselves away from an unforgettable scene. On the return journey we followed our old tracks which had become stream-

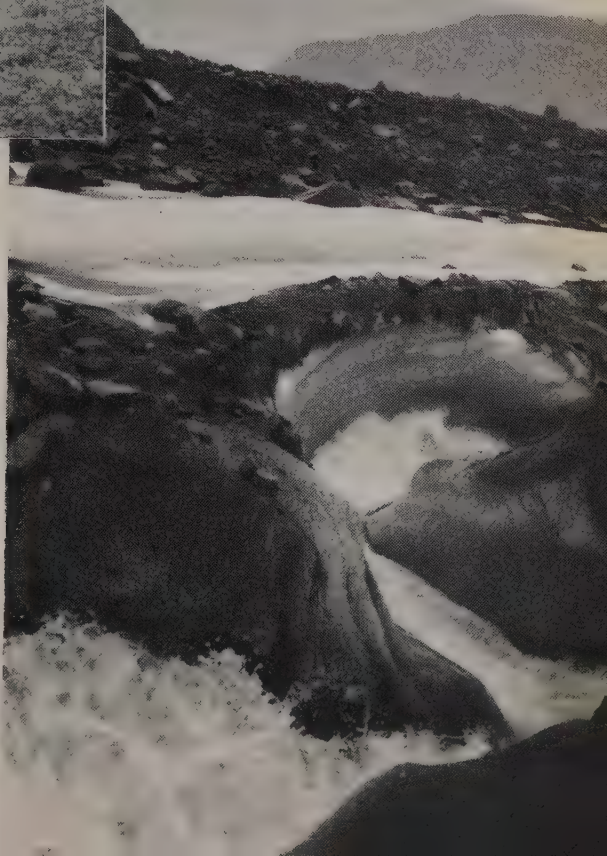


Etienne

Since it was summer, the crevasses on the ice-cap were open: in winter they would be concealed by a thin crust of ice. This crevasse contained peculiar stalagmites, rising like screens of crystal from the depths below

E. Etienne

'Rapid streams which rushed madly, helter-skelter fashion, down snake-like channels in the ice' also formed obstacles to travel over the ice-cap. These streams often disappeared into holes, re-emerging near the foot of a glacier





P. G. Mott

Mountains near Evighed's Fjord on the southern side of the Sukkertoppen ice-cap, part of the range that frames the coast of western Greenland

lined as a result of the gale during the night. The snow was hard and the temperature remained low, so that we travelled fast. The following day it was downhill all the way, and conditions were so good that we covered a distance of twenty miles, and reached the head of the valley leading down to the estuary before pitching camp for the night. It was fortunate that we did so, for in the morning Plunkett was smitten with a severe attack of snow blindness, and it was only with the greatest difficulty that we reached the base-camp that evening. It would have been a dramatic finish had not the unfortunate victim been greeted on arrival by the derisive laughter of three incredulous cynics, who rushed down to greet us.

The remaining week we spent among the 'fleshpots' of the base-camp, which

included such forgotten delicacies as tomato soup, apricots, plums and golden syrup. On September 3 the *Nakuak* arrived, and the time came to leave.

Like all good things, it is not until they come to an end that one realizes the full extent of their worth. There had been in reality few hardships, and even those that did exist were trivial enough compared to the joys that always followed. There is an irresistible charm and a sense of mystery about the landscape of Greenland, which grips one instantaneously on arrival, and on departing makes a return seem inevitable.

As we passed the estuary for the last time it lay transformed under a thin blanket of snow—the first warning that the summer had come to an end. So we left it, and so one day we shall find it again.

Among the Naga Hills

A Primitive Landscape

by DR CHRISTOPH VON FÜRER-HAIMENDORF

The landscape sketched herein, remote and unmapped though it lies on the borders of India and Burma, has recently figured in the newspapers, which described the attacks made on an expedition sent among the Naga tribesmen with the object of suppressing slavery, under the leadership of Mr J. P. Mills, Deputy Commissioner for the Naga Hills. In our number for July 1935 Mr Mills gave interesting details of some of the tribal customs to which Dr von Fürer-Haimendorf alludes and showed that, at least in fully administered territory, head-hunting had been abolished

AN immeasurable mountain country extends before our eyes. Mighty wooded ridges succeed one another, grouping themselves into lofty ranges and long chains till they finally blend with sky and clouds in the mist of the blue distance. In the extreme north-east rises the characteristic profile of Saramethi, that 12,560-foot peak on the border between Assam and Burma, which no white man has yet climbed. It is neither precipice nor ravine that has kept the mountain inviolate; only the hostility of the Naga tribes whose homes encircle it, and who cling tenaciously to their habits of head-hunting and human sacrifice. The man who reached the summit of Saramethi would be able to make a survey, if only a superficial one, of a large, unexplored territory, and thus remove one of the last blank patches from the map of India.

A similar view meets the eye on every side. Over to the north-east, where in the cold weather the snow peaks of the Himalaya are visible, the horizon is shrouded by the white mists that rise from the valley of the Brahmaputra. You almost feel as if there were no escape from this country, this mountain world that seems to have no boundary and no end.

It is in fact a world apart. While Hindu kingdoms rose and flourished in the plains of Assam, while traders plied up and down the Brahmaputra and wealthy cities grew, the mountains continued to shelter primitive tribes of ancient culture and of so martial a temperament that certain death

awaited the intruder. Down to the most recent times even those tribes who live in British territory have remained immune from Indian influence, and—thanks to a wise administration—have preserved their ancient customs uncontaminated.

The villages which lie on the highest points of the central mountain ridges are identical with those of centuries ago. No Naga ever lives in a valley. His settlements are pitched between 4000 and 6500 feet above sea level. Only one valley separates us from the village whose closely packed straw roofs shine yonder in the sun. Yet it will take us a good two hours to reach the bottom of the valley and climb





All photographs by Christoph von Fürer-Haimendorf

Over mountain summits, 4000 feet high, climb the yellow roofs of the Naga villages: only few people can afford the expensive feasts which entitle them to decorate their gables with carved 'horns'

the steep mountain-side opposite. We start the descent down lightly wooded slopes, recognizing familiar trees—oaks, walnuts and stone-pines—amid a jungle of exotic growths. There is one bush with blossoms of a delicate purple, another whose leaves gleam as white as snow but whose yellowish-red flowers are small and insignificant. The strong green of the wild fig trees is overmatched only by the highly lacquered foliage of a kind of laurel. Many of the deciduous trees are smothered in creepers the stems of which are sometimes as thick as a man's arm, while others send thin, wiry threads straight up from the ground to the branches overhead. The rhododendrons are long since overblown, but many varieties of orchid blaze among dark stems, and fleshy pink flowers peep up from the dark earth.

The wood opens out and we step into a clearing. The Nagas burn down the trees to clear the ground and the charred trunks of the larger trees are still standing amongst the planted maize, taro and millet. One or two harvests exhaust the ground; a new section of forest is burnt down and last year's clearing gradually reverts to jungle. Below the clearing the rice-fields begin. The whole mountain-side, for some thousand feet above the level of the valley bottom, is cut by terraces. Some are perhaps fifteen to twenty feet wide, others are merely narrow strips, but all are firmly revetted with walls of pebbles from the stream, smeared over with mud. Every rivulet on the mountain-side is captured, and its water led in long channels to the terraces, for the rice must be kept under water during the whole time of its cultiva-



A strange feature of some villages are the long bamboo poles with models of little birds at the top: these are smeared with birdlime and used as decoys

tion. The water flows from one terrace into that below, and a complicated system of water-rights governs the distribution of the precious moisture. Each of the terraces is levelled with the greatest care, so that the water may lie at a uniform depth, and what can be spared from the one is passed on to the next. Across the face of rocks, or wherever the ground is uneven, the water is carried along in little aqueducts of bamboo.

As we picked our slippery way through the labyrinth of terraces, we could hear from below the rhythmic work-song of a group of boys and girls. Working side by side in a row, they were planting out the rice-seedlings in the soft, flooded ground. One lad, walking ahead with a basket, throws down the green bundles of seedling plants, at short intervals, into the water.

The sun blazes on bent brown backs and is reflected from the surface of the water in a thousand dazzling rays. Hours and hours pass before the song ceases at last and the workers seek the welcome shade of a small field-hut and quench their thirst with foaming rice-beer.

At the bottom of the valley broader rice-fields line the banks of the stream, which is diverted into smaller channels to irrigate them. We cross the stream by a tottering bridge and climb the sunny hillside towards the village. The terraces stretch only half-way up, for the village is surrounded by a broad belt of thick forest. This is the people's wood-reserve from which they fetch their fuel and the timber for their houses.

Along the path that leads through the forest there are curious low, semicircular



Strong fortifications, unrivalled by any other primitive people of Asia, protect the Naga villages against the raids of hostile and head-hunting neighbours. Enormous labour is required to build them



The gateways through the ramparts are defended by stout doors, on the decoration of which the Nagas display their artistic sense in symbolical carvings: enemies' heads, denoting victory in war; buffalo heads, denoting wealth; women's breasts, denoting fertility

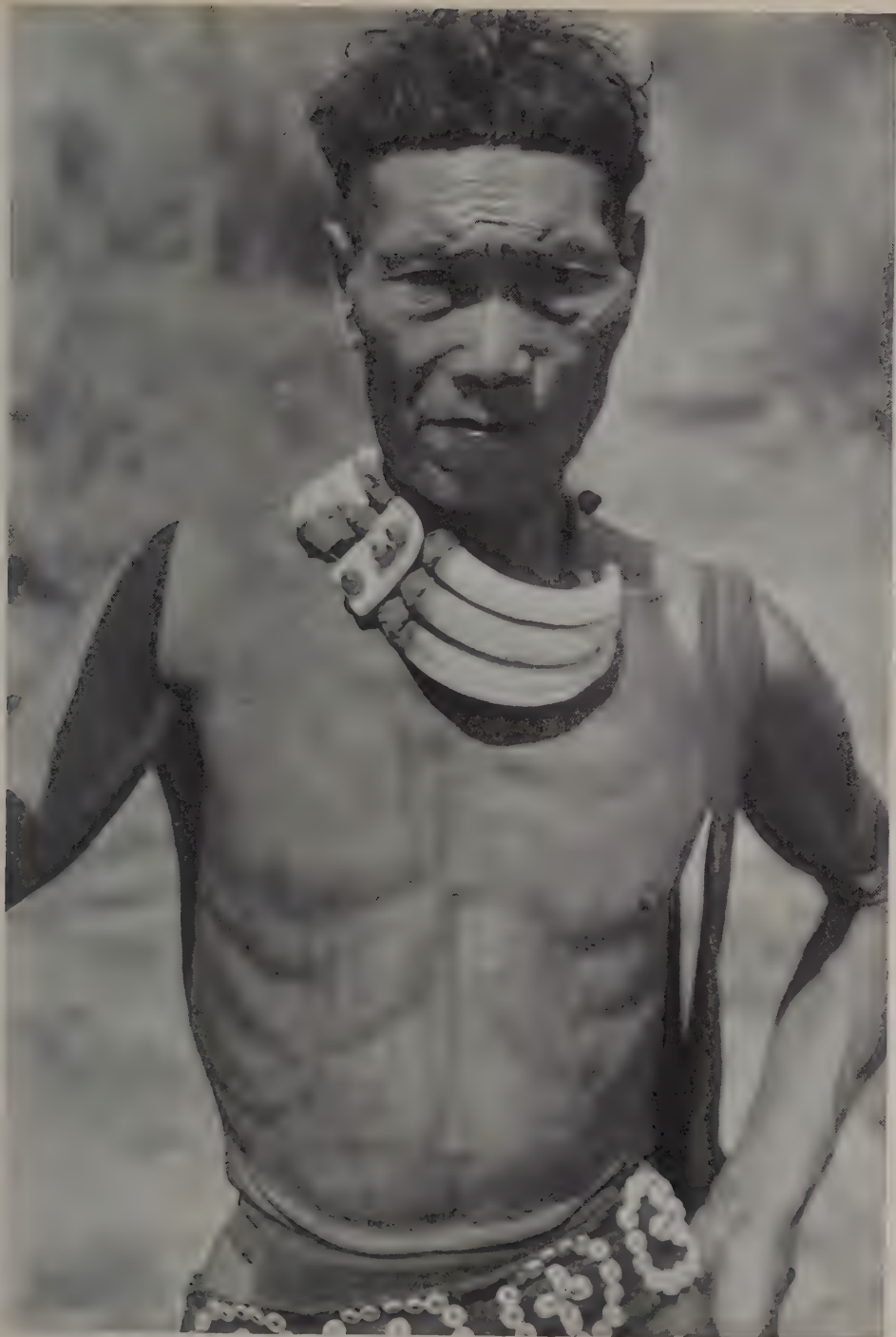


The pillars which support the high gables of the larger houses are likewise richly carved. The base of this pillar bears a female figure with, on each side of her head, a conventionalized hornbill—tail uppermost and beak downwards—denoting success



The most striking buildings in a Nagavillage are usually the bachelors' barracks: the boys and unmarried men sleep in them while the married men use them as a sort of club.

They sit about in the open porch, which is protected from the sun by screens of palm leaves and baskets, used to hold the remains of food sacrifices



A Naga warrior of the older generation: his tattooing shows that he has taken several heads



The basis of the Angami Nagas' economic life is the cultivation of rice, in elaborately terraced and irrigated fields: much of the work is done by gangs of young men and girls, whose rhythmic songs are heard the whole day long at planting time

platforms and mounds, built of gravel and quarried stones. These are graves, and they serve as seats and resting-places for the workers returning heavy laden from the fields. An upright stone in the middle of the grave represents the dead man or, as the natives say, *is* the dead man. Many of the graves have other stones on them as well, to commemorate the deeds of the deceased. Large stones indicate the number of heads the dead man has brought in, while the smaller ones represent the wives whose favours he enjoyed during his lifetime. On the grave of one primitive Don Juan I counted 62 of these. It would, however, be quite wrong to conclude that amongst the Nagas amorous conquests are counted particularly creditable; the stones show only that the dead man fulfilled his duty in life. This is easily understood in

a land where a small village is exposed to constant danger and only a virile clan can hold its own. The custom of burying the dead along the road leading to the fields is rooted in the idea that the magic powers of the dead are thus retained for the service of the village and will attach themselves to the living as they pass daily to the fields. For the dead promote fertility, not so much by active assistance as by the mysterious powers inherent in man, which are magically communicated by the dead to the fruits of the field. The head-hunting of the Nagas is ultimately based on the desire to increase your own village's stock of fertilizing soul-power by securing the heads of strangers.

Clumps of bamboo as high as a house, and megalithic stone monuments, indicate that we are nearing the village. It is built



At the end of each terrace of houses in the villages is a high platform with a wide view over the wooded Naga hills. Here the young men sit 'perched like swallows' with bowls of betel-nuts and the inevitable rice-beer in tall bamboo mugs



like a fortress occupying the whole summit of the mountain. The path now climbs steeply through a narrow, rocky, sunken lane which is covered with a tangle of thorny creepers, up to the great gate in the stone rampart. A handful of warriors could easily hold this entrance against a superior force of the enemy. The stout wood of the great door is deeply carved with designs of buffalo horns, enemy heads, women's breasts, drinking-horns and suns—all emblems of fertility and fortune.

Another few steps, along a second hollow lane, and we are inside the village. Carved pillars support the high gables of large houses in front of which men are sitting. Their loins are clothed with a dark apron studded thick with cowrie shells; some are naked from the waist up, others have wrapped themselves in a white cloak striped with black. They wear several rows of beads round their necks, threaded with long-shaped pieces of mussel-shell, cornelian and a blueish stone. The younger men have their hair shaved, leaving only one lock at the back, round which coloured wool is wound. They are fond of wearing red and white wool also in the lobes of their ears. Many of the rich have ivory bracelets on their upper arms, the full thickness of the elephant's tusk. These must weigh several pounds. The women who peep shyly out of their doors are all wear-

ing the large brass ear-rings peculiar to the Angami Nagas. The weight of these is so great that they are supported by a band across their straight black hair. Their broad, mongoloid features are not exactly beautiful, but their expression is cheerful and friendly, and, in their deep-blue cloaks, they are often extremely picturesque.

The village climbs uphill like a flight of steps. Scarcely three houses stand on the same level and a person strolling through the village has to scramble incessantly up and down stone steps and slippery paths. From the front of one house you can often look down thirty feet on to the neighbour's roof. At the edge of the separate terraces, platforms are propped on tall posts and these serve as look-outs for the young men. You can often see a whole row of them perched like swallows on these airy scaffolds, each clutching in his hand his tall bamboo mug with the inevitable rice-beer.

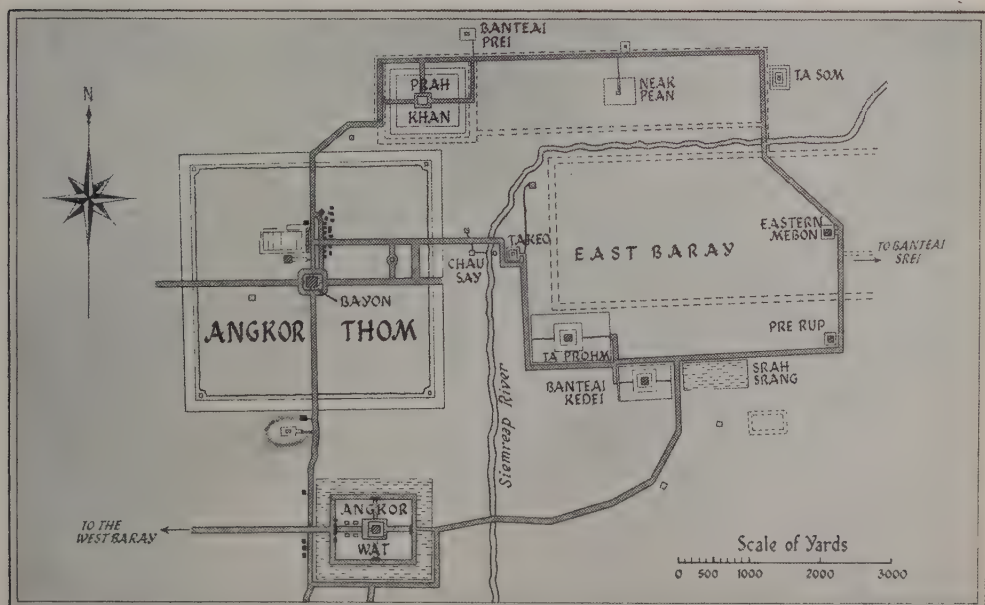
From up here you have a wide view over the land, over the yellow roofs and the fantastic gable-carvings of the villages, over the bamboos trembling in the breeze, over the clear green of the forest belt and down over the shining rice-fields whose autumn crop will fill the great storing-baskets of every house and—if the spirits are propitious—will guarantee to the whole village a care-free life with oceans of rice-beer.



STONES OF ANGKOR: GODS AND MEN

In our April number Miss Rosita Forbes described the mysterious ruins of Angkor and recounted, so far as it is known, the story of the Khmers who built that 'Miracle of Cambodia'. The illustrations to her article, however, were confined (owing to limitations of space) to the city of Angkor Thom and the temple of Angkor Wat, giving a general impression of their more massive features but including none of the minor

buildings and only a few of the sculptural details which help us to reconstruct the life and spirit of a vanished civilization. The following pages are intended to repair this omission. Here are exquisite bas-reliefs which reveal the religious ideas of their designers and show the Khmer people at peace and at war. Here, too, are lesser outlying temples, gems of architecture and decoration, begirt by the engulfing Cambodian forest







J. T. T. Fletcher

Nine out of ten of the surviving Angkor monuments are of a religious nature, and so is their prevailing decorative note. Buddhism and Hinduism both flourished under the Khmers but it was the latter which contributed the most charming motifs. (Opposite) In a pavilion in the corner of Angkor Wat are groups of female divinities with gorgeous head-dresses, chatting and adorning themselves while their servants attend below



(Above) Khmer fantasy extended to composite and improbable creatures, such as the five-headed horse who appears, surrounded by performers of all kinds, on the Royal Terrace in Angkor Thom. There are others—seven-headed snakes, human-bodied eagles, giant geese. (Right) Two of the Devatas, lovely demi-goddesses who, with the Apsaras, celestial nymphs that danced or flew in the air strewing garlands of flowers, formed the principal female element in the Hindu pantheon



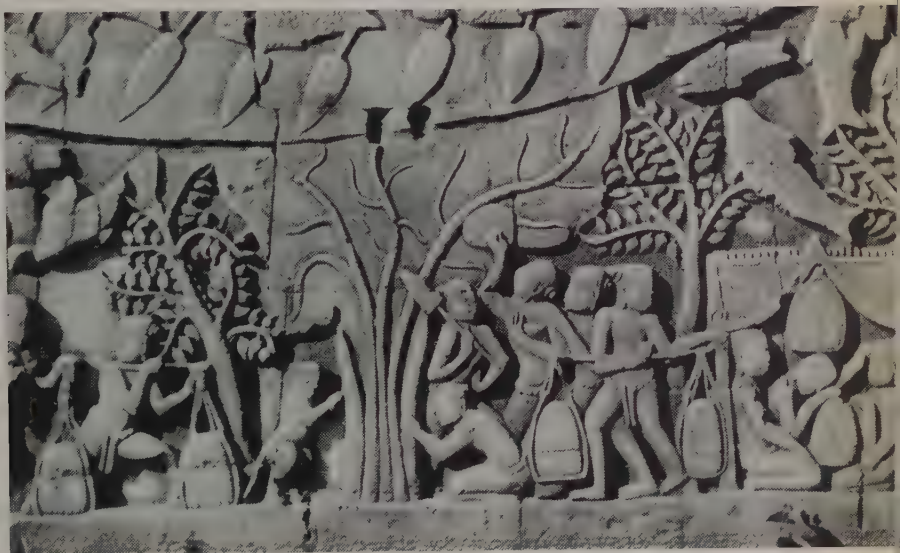
John He

The Khmers delighted to record their feats of war. In the Bayon temple we see them (above), short-haired and dressed, like the Cambodians of today, in a single garment, going to war with their elephants and (apparently) a harlequin to encourage the troops! Sometimes naval engagements are depicted, against an enemy (below), long-haired and wearing hats like flowers upside-down

John He



Below the nautical battle-pieces, at the water's edge, are scenes of ordinary life. At home (top) the men argue, one woman handles her child, while another searches her husband's head for lice. Out of doors (middle) work is conducted with tools and carrying-poles that differ little from those of present-day Cambodia. In royal kitchens (bottom) cooks and serving-men busily prepare the dishes for a banquet





Martin Hürlimann

The largest outlying building is the 9th-century temple of Prah Khan (meaning the 'Sacred Sword')—



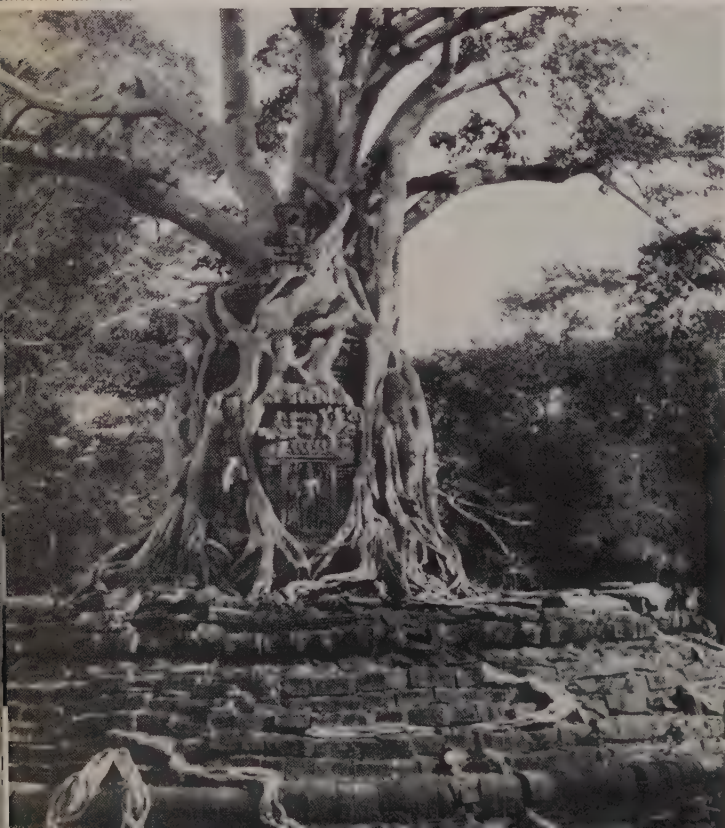
Martin Hürlima

—guarded by lions and Nagas, serpent founders of the Khmer race, with fans of seven heads



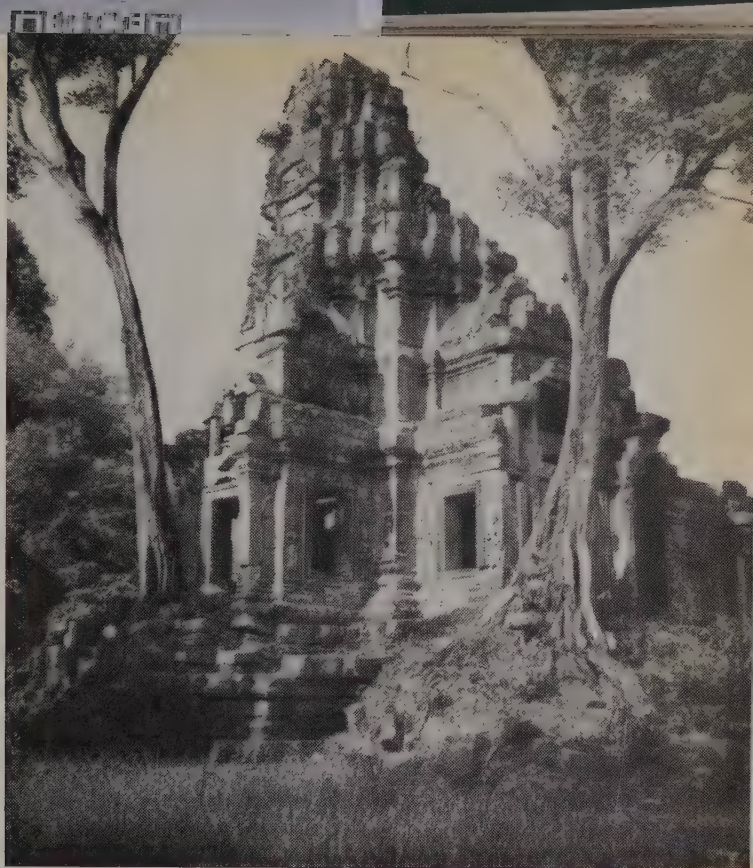
allienne Whitmarsh

Martin Hurlimann



Probably contemporary with Prah Khan is the temple or cloister of Ta Prohm, 'Ancestor Brahma' (above). According to an inscription found there, 18 high priests, 2740 ordinary priests and 2232 acolytes resided within the enclosure. The strangling forest in which for centuries Angkor lay buried still holds sway over the gateways and pavilions of Ta Prohm. At Neak Pean, 'Entwined Nagas' (left), a banyan tree has grown right round the central shrine

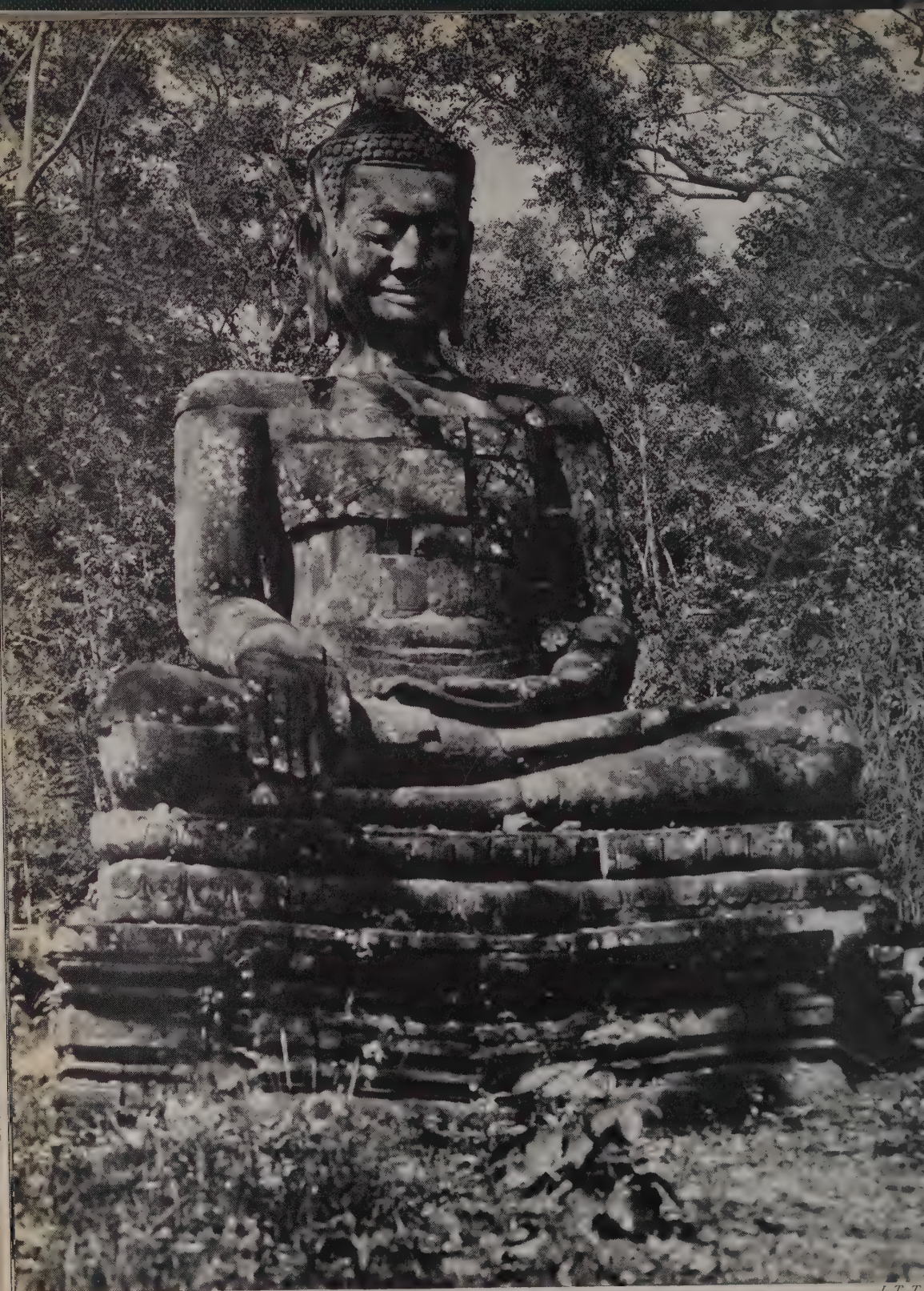
Lying just outside the main gate of Angkor Thom is the temple called Chau Say (right). It belongs to a later period of Khmer art, to the 11th century. The destruction of Angkor is said to have taken place in the 14th century. Thereafter its temples and palaces decayed amid the forest until, five hundred years later, they were uncovered by French archaeologists and the sunlight shone once more upon their stones



J. T. T. Fletcher

Christobel Hardcastle





Silent, ever smiling, a giant Buddha has seen Angkor rise, flourish and fall

Bird-watching on the British Coasts

by SETON GORDON

Readers of our February number will remember Mr and Mrs Seton Gordon's remarkable pictures of the golden eagle's domestic life. Patience and skill of an equally high order were needed to obtain the illustrations accompanying the following article, which shows what pleasure and interest are, as Mr Seton Gordon says, 'presented free' to everyone who takes a summer holiday near the cliffs of Britain; for many sea-birds obligingly continue nesting until late in the year

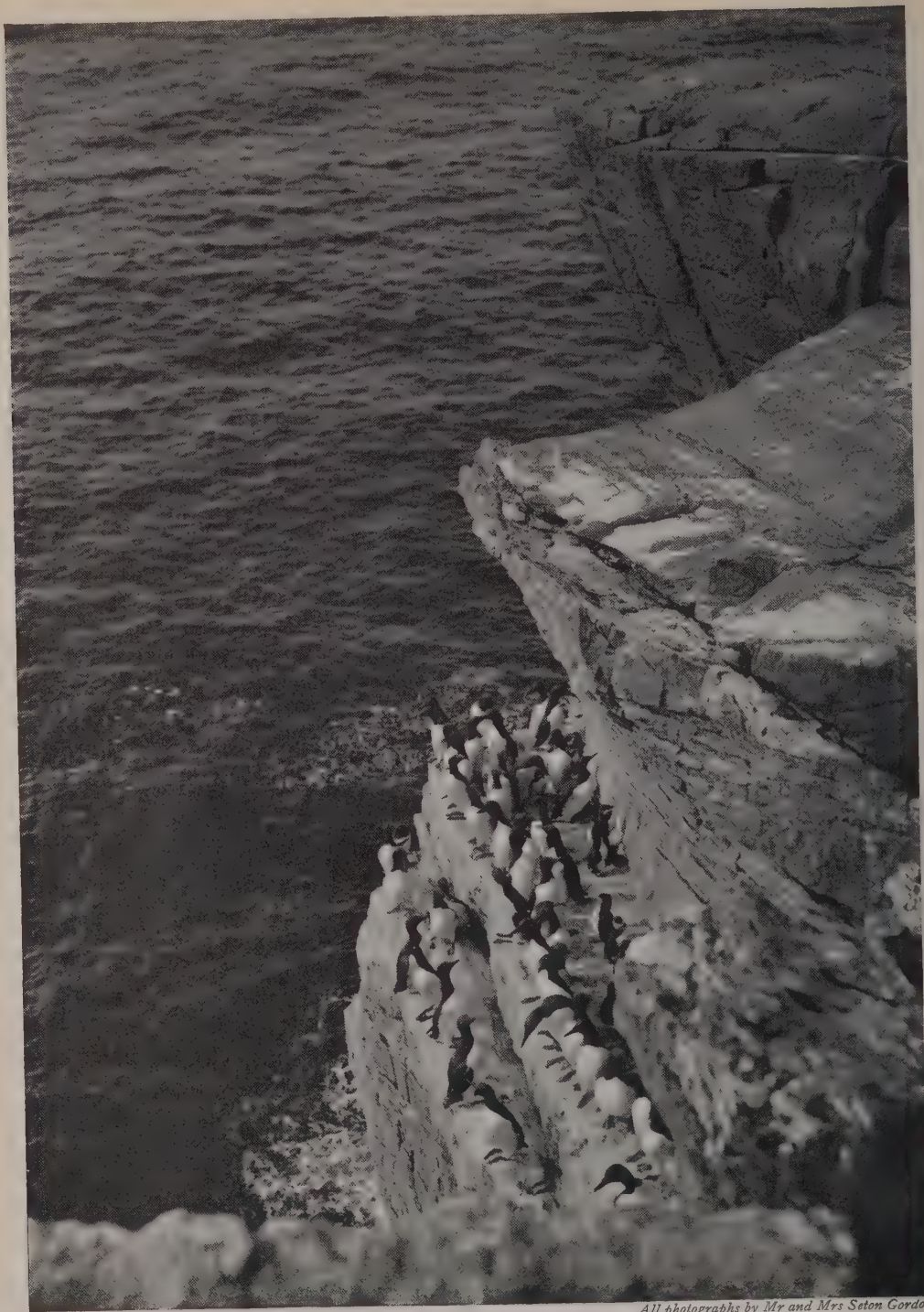
IN the opinion of most people the study of birds is an occupation for the expert or the enthusiast: the average person believes that he or she has not the time for such studies. It is true that in order to become familiar with most of the land-birds a considerable amount of time and patience are necessary. To observe, for instance, the home life of the King of Birds, the magnificent golden eagle, the student must spend many hours in a cramped hide, often in bitter cold, and to study raven or kite, curlew or golden plover, or even the homely lapwing or the well-known thrush or blackbird, necessitates considerable patience and often considerable discomfort. But sea-birds are very different, and the delights of watching them need be lessened by no arduous walks nor climbs, nor long waits in cramped, icy hiding places.

Sea-birds, especially those which nest in large communities, have little fear of man. Indeed they know little of mankind, for their home, except during the nesting season, is on the ocean, often far from land. At one time sea-birds used to be snared on their cliffs and their young taken for food, but they are now rarely disturbed, and provided the observer remains seated quietly near the top of their cliff, pay little heed to the human onlooker. A pair of powerful field-glasses will entitle the novice to a front seat at one of nature's most remarkable shows, presented free to any holiday-maker who has the energy to walk a few miles, sometimes even a few hundred

yards, from the main road. Personally I can imagine nothing more delightful than to spend a summer day beneath the blue sky, beside the blue ocean, watching the teeming bird-life on some spray-drenched cliff, or on some isolated rock-stack, a hundred yards or more off-shore. Here no expert bird knowledge is required; all that is necessary is that the birds should be identified, and even if there is no expert at hand to do this, the birds can be observed so clearly that there should be little difficulty in identifying them from the plates in any bird book.

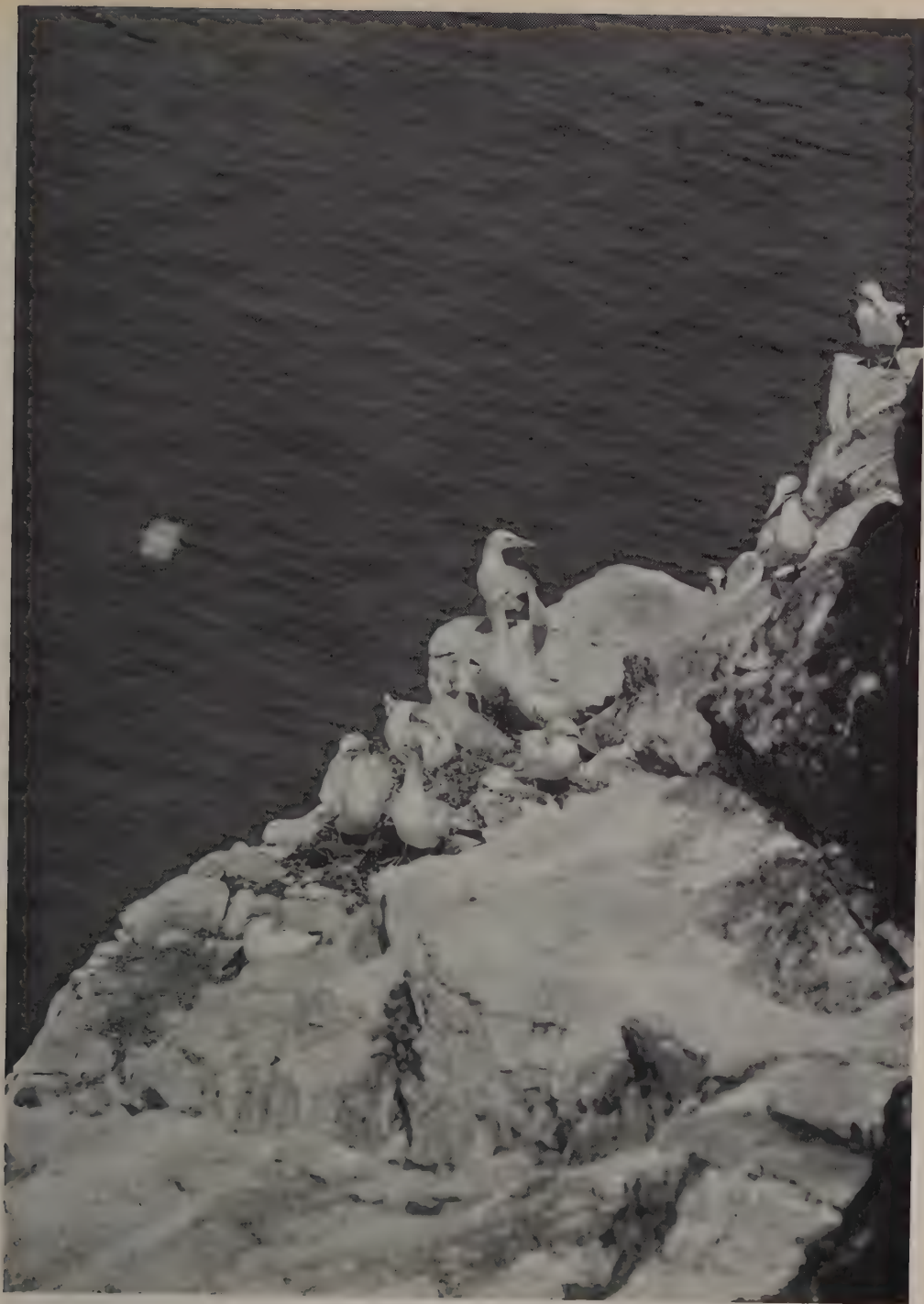
In one article it is impossible to deal exhaustively with all the birds which nest on the British coasts, and display to the observer their habits of courtship and of feeding, their communal and private lives, but I shall attempt to give an account of those sea-fowl most generally known around the cliffs of Britain. The quaintest of these fowls are perhaps the auks. It is now close on a century since the last British great auk was killed on St Kilda, but the great auk, being unable to fly, was unable to escape its human enemies who massacred it ruthlessly. In those days we as a nation were little interested in birds. Had the great auk escaped extinction for a century longer, the few survivors would at the present day have been afforded as efficient protection as possible, and might, like the kite, have been preserved. But that was not to be, and the great auk is extinct not only in Britain but throughout the world.

Although the great auk has gone, other



All photographs by Mr and Mrs Seton Gordon

Among the auks, most quaint of sea-fowl nesting in Britain, the commonest is the guillemot—



— while the largest sea-bird of British coasts is the gannet or solan, first cousin of the pelican



Guillemots nest in dense crowds, as a protection against marauding gulls, who devour their eggs. Here, migration of guillemots to the sea having begun, a rock-stack is becoming less crowded

auks are still with us, and the razorbill, which may be seen nesting on almost any British cliff, may be said to be the great auk in miniature. But the auk which is most commonly seen is the guillemot. This bird, which the French, perhaps because of its quaintness, named Little Willy, is the most numerous sea-bird of Britain. Hundreds upon hundreds of thousands of them nest—if the term may be used, for they make no nest but lay their single egg, large and pear-shaped, on the bare rock—on the British cliffs. No bird has, at the breeding-grounds, so communal a life. The guillemots so densely crowd their ledges that often no bare rock is visible between the birds. This overcrowding must be unpleasant, and have its disadvantages, but the habit is a wise one, for the birds are thus protected from their enemies, and of these

enemies the herring gull is the most persistent. Herring gulls—and who are we humans to blame them?—love an egg diet, and are ever on the look-out for an unguarded egg, which they devour with relish, so that the guillemots must protect themselves by weight of numbers.

From the end of July until the end of March the guillemots make their home on the sea. During all those months they are out of sight of land, and in storm, when the ocean rollers give them no rest, their life must be one of great hardship. But at length comes the spring, and then the thoughts of the guillemots turn to their rocks and they fly shoreward and make their first landing. During the present year I had the good fortune to see that landing, for at the end of March I was staying on an island where innumerable sea-birds have their spring and summer

home. On Saturday, March 27, the guillemots' nesting-cliffs were deserted. Not one guillemot was to be seen, either ashore or on the neighbouring sea. When the orange moon climbed above the horizon and shone in a frosty sky the guillemots' stacks rose, dark and silent, from the sleeping sea. The next morning was calm and sunny, and many guillemots were flying in from the ocean and alighting with obvious pleasure on their ledges, but before sunset each bird had left the rocks and had flown again out to sea.

It was on the morning of the following day that the rocks presented a memorable appearance. During the night, or the early morning, the guillemots had arrived in force, and for a couple of hours around midday I lay on the sun-warmed withered bracken above a gully beloved of the guillemot and watched the courtship of the crowded birds only a few yards from me. So densely did the guillemots swarm on their ledges that newcomers could find a resting place only by running lightly (with wings outspread to balance them) over the backs of the birds already assembled, until they found, with difficulty, an unoccupied corner. From this closely packed community came a strange medley of sound—a crooning, a gasping, harsh cries of anger, all blending with the cadences of the thundering surf beneath the rocks. It must have been a thrilling moment for the birds to be home again; to feel solid rock beneath their webbed feet, yet they were a little strange to these new surroundings, and from time to time the cry of a herring gull would cause each head to gaze anxiously skyward, and then I could see more plainly the snowy plumage of the breast, and the soft silky brown feathers of head and neck.

There are few cliffs in Scotland, England, Wales or Ireland, without their spring and summer population of guillemots. Some of these birds lay their eggs on ledges only a few feet above the reach of the waves; others six and even seven hundred

feet above the ocean. The guillemot's egg is large for the size of the bird and is often very beautiful. Its ground colour may be brown, almost white, or again a lovely blue. When brooding its egg the bird sometimes holds it on its feet, like the penguin, and when a colony of guillemots is suddenly disturbed and the birds take precipitate flight, several eggs are usually swept into the sea, or fall to the rocks below and are broken. Although the guillemots arrive in force at the cliffs before the end of March, the first eggs are not seen until May is half over, and in the more northerly districts of Britain it is June before the birds lay. When the young guillemots begin to appear there is great excitement in the colony. Birds which nest in such dense colonies have no privacy, and I have seen amusing incidents of a chick being mothered by the wrong parent. The feeding of the youngster is not lightly undertaken. The parent which has caught the fish arrives on the rock after a flight of perhaps fifty miles from the fishing-grounds with the fish half swallowed and the tail projecting just beyond the tip of the bill. The parent in charge of the chick is usually unwilling for a time to allow its mate to obtain even a glimpse of baby, but at length, after much crooning, the fish is given to the nestling and is swallowed whole.

The razorbill, which, as I have mentioned, is in some respects a miniature great auk, is usually found on the same cliffs as the guillemot, but in lesser numbers. At a distance the razorbill is not unlike the guillemot, but an inspection through binoculars will reveal the difference in the shape of the bill. The guillemot's bill is relatively thin and pointed, and is dark in colour: the bill of the razorbill is thick and blunt, and on its dark surface are narrow bands of white. The razorbill gives the impression of being a rather heavier bird, more thick-set, and the tail is rather longer (the guillemot's tail is short, almost to the point of

absurdity). Like the guillemot, the razorbill lays a single egg, but rather smaller and less pear-shaped than the guillemot's egg. Although the razorbill is greatly exceeded in numbers by the guillemot, it is by far the more intelligent of the two species. It never drops its egg into the sea; it never mothers the wrong baby by mistake; it rarely allows a herring gull to make a meal off its egg.

I cannot imagine two razorbills behaving like the two guillemots I watched one evening last summer on their cliff. The two characters in this story were standing near one another, but judging by their behaviour were not friends, nor even casual acquaintances. One of the two had arrived with a small fish, which it was apparently in no hurry to give to its nestling. The tail of the fish, peeping out beyond the tip of the captor's bill, had an irresistible attraction for the second bird, which several times gave it short, playful pecks. Then of a sudden, after the two birds had stood apparently lost in thought for several minutes, the teaser with a sudden quick movement seized the fish by the tail, and in an instant had sent it spinning to the rocks beneath. I expected the despoiled bird to show resentment, or at least to make an effort to see where the fish had gone. It did neither, and did not even move, but stood quietly, staring with a look of imbecility ahead of it!

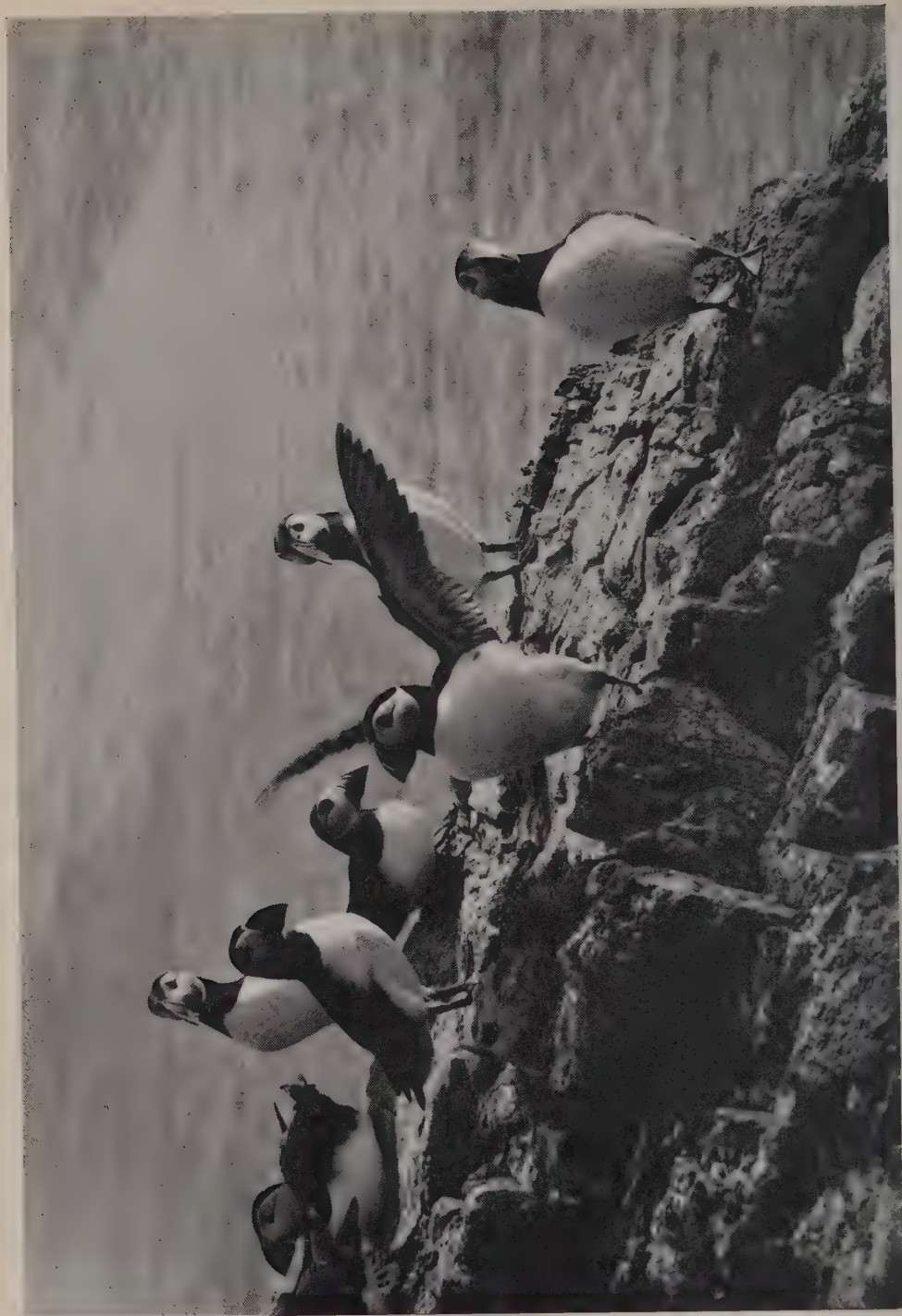
The third auk which is commonly found around the coasts of Britain is the puffin, a bird which grows at each nesting season a bill so large and so brightly coloured that in some districts the puffin receives the name of sea-parrot. The puffin is a month later in arriving at its nesting haunts than either the guillemot or the razorbill and nests not on ledges of rock but in burrows on grassy slopes. The puffin's burrow is so deep that the human arm is rarely long enough to reach the small nest of dry grass at the end of it. The puffin sometimes nests in a rabbit burrow—for it has little difficulty in eject-

ing the rightful owner—but more often excavates a burrow for itself. Last summer I watched a puffin, not more than four feet from me, digging its nesting hole. The bird, with that quaint self-important mien so often seen in the puffin, disappeared down the hole. Two other puffins came to see how the work progressed, and after a time were greeted by a shower of fine earth, propelled with considerable vigour from the mouth of the burrow. At intervals further streams of earth were ejected, and after a time the puffin itself appeared, looking satisfied with the result of its subterranean labours, and walked around, very erect, on its toes. It is interesting that the puffin is the only one of the British auks which can walk on the full length of the leg. Both razorbill and guillemot walk resting on the thigh bone, for the lower part of the leg is not sufficiently strong to bear the bird's weight.

The auks obtain all their food by diving, using their wings to propel them beneath the surface. The cormorant and the shag, larger sea-birds of somewhat different habits, also dive for their food, but keep the wings *closed* below the surface and rely on their powerful webbed feet for their power and for their steering. The cormorant is considerably larger than the shag, which is sometimes known as the green cormorant. The cormorant is, broadly speaking, a bird of the eastern seaboard of Britain, the shag of the western seaboard and of the isles. The shag fishes only in the sea, but the cormorant frequently enters river estuaries and, since its appetite is voracious and it preys on sea-trout and the smolts of salmon, it is deservedly unpopular among fishermen, and in some places a reward is paid for its destruction. The shag is smaller than the cormorant, and has a conspicuous crest. The cormorant, too, has a crest during the nesting season, but its crest is less noticeable, and rises further back on the head. Both cormorants and shags nest in colonies, and since the birds whiten the rocks with their droppings the



The razorbill, an auk, carries fry for its young arranged across its bill, head and tail alternately



Puffins—pompous, self-important 'sea-parrots'—hold their parliament on a special rock at the nesting-grounds



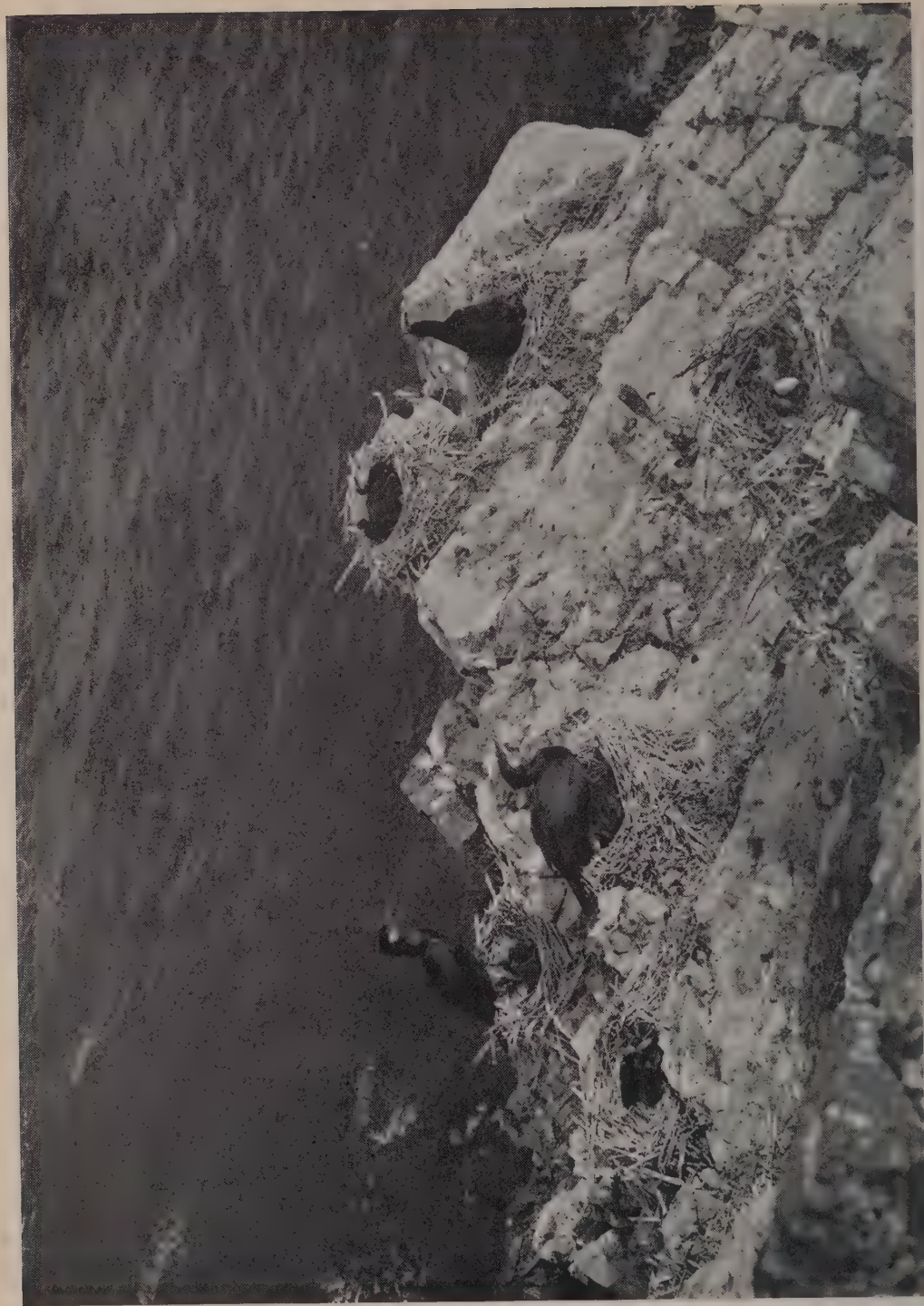
Puffins usually nest on islands, their eggs hidden in burrows on grassy slopes—so deep that the human arm can rarely reach them

nesting places are visible at a considerable distance. Like most sea-birds the cormorant and shag are none too cleanly at the nest, and it is interesting to realize that the great guano deposits are produced by birds of the same race.

Cormorants arrive at their nesting rocks in March. When they first come they are wary and difficult to approach, but in the spring of the present year I was able to watch for a time their quaint, almost grotesque courtship. What I presumed to be the male bird stood in a statuesque position, slowly and tirelessly opening and closing his wings, and displaying the conspicuous white thigh-spots. A lifeboat, with its oilskin-clad crew on deck, passed at speed close to the rock and gave the cormorants some anxiety, and a fishing boat steered in so close to them that a number of the birds flew out to sea, but the remainder, when danger had passed, continued their courtship display. There are several phases of this display. In one

the neck is laid close along the back, then after a few minutes the neck is held stiffly forward at full length in a horizontal position, or else is held vertically, with the head pointing grotesquely skyward. Some of these movements of a cormorant resemble a reptile rather than a bird, yet there is a stately, unhurried solemnity about them most interesting to observe—as when a bird with a dignified movement picks up an ancient stick, whitened and weather-worn, that has lain on the nesting rock since the previous summer.

I have mentioned that herring gulls steal any unprotected guillemots' eggs. These gulls lose no opportunities of eating the eggs of the cormorant. A cormorant's eggs are blue, with a white, chalky outer deposit which causes them to be very conspicuous. When a cormorant is brooding on her eggs a gull dare not attack her, but when some alarm has caused her to fly from the nest (cormorants, as I have said, are timid birds) a herring gull often



A colony of cormorants, showing eggs and young in the nests. Cormorants arrive at their nesting-grounds in March



The guano from the nesting cormorants soon makes their rocks as white as snow. The great guano deposits of other parts of the world are produced by birds of the same race



Two shags, or green cormorants, guarding their eggs; and two razorbills similarly occupied



The herring gull is a notorious stealer of eggs from other sea-birds' nests. This parent is teaching its downy young (note their remarkable protective coloration) how to suck eggs

swoops down and makes a meal off one of the eggs before her return. Last summer my wife and I were photographing from a hide a cormorant colony, and several pairs of herring gulls which nested on the outskirts of this colony became so daring that they would swoop down and carry off a cormorant's egg before the owner had time to fly in from the sea. One day I was in the hide when a herring gull alighted at the side of a cormorant's nest and picked up an egg in its bill. At this I shouted at the top of my voice, and every bird in the vicinity—gulls and cormorants—took precipitate flight. The marauding gull also flew, but even in that sudden excitement retained its presence of mind, and flew off carrying the stolen egg in its bill. With the other birds it flew a little way out to sea, then returned, still carrying its prize, and proceeded to eat the egg with relish.

My wife and I hit upon a plan which would, we fondly imagined, once and for all cure the herring gulls of the cormorant colony of their egg-stealing habits. In the hall of the castle where we were staying at the time were a few blown guillemots' eggs, taken years before because of their unusually beautiful markings. One of these eggs we filled with mustard, and carried it to the cormorants' colony, where we placed it in a prominent position. We then entered the hide, hoping that we should see the gulls receive a lesson. One of the egg-stealing herring gulls was quick to notice the egg. A guillemot's egg is thick-shelled, and, perhaps because this egg had been kept, blown, for a number of years, it was unusually tough. At all events the gull had considerable difficulty in breaking the shell and reaching the contents, and we chuckled to ourselves at the un-



A pair of Kittiwakes, most home-loving of seagulls, gaze affectionately at their family

pleasant surprise awaiting it. Judge, then, our astonishment when the gull with relish deliberately and slowly ate the whole of the mustard-filled egg! Our attempt to teach it a lesson had ignominiously failed!

Thousands of herring gulls were nesting on the grassy slopes near the cormorant colony. Many of these nests contained deserted eggs, and we used to carry on each of our visits one or two of these eggs, and place them in a deserted cormorant's nest. The herring gulls appreciated our consideration, and their downy young soon became as expert egg-suckers as the parents.

The herring gull is distinguished by its large size, its pearl-grey wings and mantle, and its white breast. The only seagull with which it is likely to be confused is the common gull, which bears a close resemblance to it, but is considerably smaller. Both herring gull and common gull have the actual wing-tips white, although a dark band is present near the tips. The kittiwake gull may be recognized by the black wing-tips. The black-headed gull also has black wing-tips, but this gull nests usually inland on English meres or Scottish lochs, and not on the sea coast. Of the other numerous British gulls, the greater black-backed gull and the lesser black-backed gull can be identified by the dark brown, almost black, backs and wings.

No essay on the birds of the British cliffs would be complete without mention of the fulmar petrel, or fulmar as it is more usually named. At first glance a fulmar may be mistaken for a gull, but the flight soon shows it to be something very different. The fulmar's flight is pure poetry: the bird glides backwards and forwards across its nesting cliff with scarcely a movement of its wings. The law of gravity appears to be powerless against it. No butterfly drifts more buoyantly on the breeze than the fulmar, but whereas the butterfly must travel with the air current the fulmar progresses with an almost complete absence of effort against it. Most species of birds

which increase and prosper are disliked. The sparrow and the wood-pigeon are examples of this. It is therefore pleasant to know that a bird so admirable as the fulmar has increased to a remarkable extent during recent years. In the middle of last century the only British nesting station of the fulmar was on the remote island of St Kilda, a hundred miles and more west of the Scottish coast. From St Kilda the fulmar has spread down the coasts of Scotland, England and Ireland, and each year new colonies are founded. The fulmar lays one white, shiny egg, and its period of incubation is almost twice as long as that of the gulls. The raised external opening to the nostrils is a distinctive feature of the petrels, and is seen strikingly in the fulmar.

The tribe of the terns or, as they are sometimes called, sea-swallows, is illustrated in this essay by the Arctic tern, seen on her nest amid flowering sea-thrift. The terns have been named sea swallows because of their graceful and delicate flight. They are late in arriving from their winter quarters and the nesting colonies of guillemots, fulmars and kittiwakes have been established a full six weeks before the sea swallows arrive.

Almost all sea birds are communal in their nesting. Guillemots cluster to a favourite nesting site in their tens of thousands, and puffins fly over their grassy islands in numbers so great that they literally obscure the sun. Certain species of sea-fowl are frequently found nesting together on the same rocks. Amongst the guillemots and razorbills, kittiwake colonies are usually to be found. Fulmars, cormorants and terns prefer the company of their own species, and do not associate readily with other birds.

All sea-birds of the coasts of Britain are alike in that they feed chiefly—most of them solely—on fish. The guillemot brings to the young one fish, held in the bill and parallel to it, but the razorbill catches as many as six smaller fish before it thinks



A bird which is happily increasing on our coasts, the fulmar, on her nest among sea-thrift



The Arctic tern, one of the greatest wanderers among birds and believed on occasions to fly from Arctic to Antarctic and back during the year

of returning home. The fish are held *across* the bill and are sometimes arranged—as is seen in the illustration on page 143—carefully head to tail. The fulmar and the kittiwake feed their young on half-digested fish. The gannet or solan, largest of our sea-birds and a strong, graceful flier, encourages its young to thrust its head far down the parent's throat and there seize unseen the partially digested herring or mackerel which has been caught and swallowed perhaps a hundred miles away. The gannet captures its fish after a spectacular aerial dive. Kittiwakes also dive skilfully from considerable heights, but birds such as the guillemot and razorbill, puffin, cormorant and shag, begin their dive not while on the

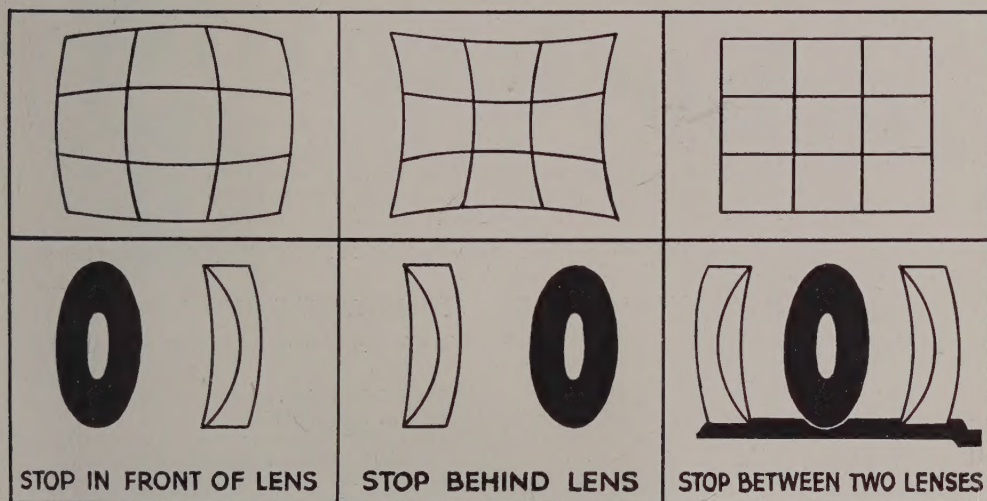
wing but while swimming on the water's surface.

Sea-birds vary considerably in the length of their nesting season. They are nearly all of them summer rather than spring nesters, and the young of the gannet and the fulmar do not leave the nest until September. The stormy petrel, the smallest of our sea-birds, is the latest of them all to lay, and I have seen young stormy petrels in the nest in November.

The young of the guillemot or the razorbill is looked after at sea carefully by one of its parents, but the young of other sea-birds, such as the gannet and the petrels, is deserted before it can fly and is compelled by hunger to take, unaided, the first perilous flight over an unknown ocean.

PHOTOGRAPHIC NOTES

Edited by F. S. Smythe



A window photographed with a meniscus achromatic lens opened up to more than $f6.3$ would appear distorted as shown above. When the stop is placed between two such lenses distortion is eliminated

3. THE RECTILINEAR LENS

A simple meniscus lens can only take pictures which are clear-cut all over if stopped down to $f16$. With this aperture, however, it is not possible to make correctly exposed snapshots in poor light, or to 'freeze' rapid action with a really fast shutter. It has already been explained in a previous article that the glass of a simple meniscus lens bends the blue rays more than the red, which causes a blurring of the image known as chromatic aberration. This defect is only of importance when the lens is opened up from $f16$ to, say, $f11$ or $f8$.

In order to make it possible to use an opening of $f11$ or larger, the simple meniscus lens is corrected for chromatic aberration by cementing to it a second lens made of a different kind of glass. This doublet of two lenses was described in the first of these articles and is known as a 'meniscus achromatic' lens.

At $f8$ or even $f6.3$, a meniscus achromatic lens will take perfectly good photographs so long as the principal subject is confined to the centre of the picture. If the subject is so large or so near the camera that it fills the entire negative, a complete picture can only

be formed when the light passes through the lens near its margins. In these circumstances a meniscus achromatic lens causes a bending of all lines near the edges of the image, owing to the curvature of the 'field' on which the image is focussed. This is an inherent defect of all single lenses, and is known as 'curvilinear distortion'.

The use of a stop *in front of* a meniscus achromatic lens opened up to more than $f8$ causes the marginal lines of the image to curve *outwards*. If the stop is placed *behind* the lens, the lines curve *inwards*. By using *two* achromatic lenses and placing a stop *between* them, the inward bending due to the first lens is counteracted by the outward bending due to the second lens, and the lines are straight. In this way an almost perfect picture is produced, even when large or near objects are photographed with an aperture of $f6.3$.

This arrangement is called a 'rectilinear' lens. Since it is merely a combination of two meniscus achromatic lenses, it is not very expensive to produce, and is therefore included in many cameras costing no more than two or three pounds.

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